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ANNUAL REPORT

OF THE

SECRETARY OF WAR

FOR

THE YEAR 1885.

IN FOUR VOLUMES.

VOLUME IV.

PART 1.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1885.

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REPORT

OF THE

CHIEF SIGNAL OFFICER.

SIGNAL OFFICE, WAR DEPARTMENT.
Washington City, October 10, 1885.

SIR: I have the honor to submit herewith my report upon the work of the Signal Service during the fiscal year ending June 30, 1885.

INSTRUCTION.

The course of instruction pursued at Fort Myer has been enlarged and otherwise improved, and it now provides for the theoretical and practical instruction of officers and men of the Signal Service in the duties required of the Signal Corps in time of war. It is the theory that all connected with the corps shall be constantly available for all branches of military service for which the Signal Corps is maintained. The signal corps and telegraph train is now recognized by all foreign powers as most essential in modern warfare. In active service the duties require the men to be mounted and the trains must be moved by horses. During the past two years not one animal has been at my command, available for this mounted instruction. The field train should be fully equipped in order that the men may be taught to ride and manœuvre a telegraph train in the field.

During the year ending June 30, 1885, five officers and thirty-six men received instruction in the regular course of military signalling at Fort Myer. In May, 1885, a system of field practice was inaugurated for officers and men on duty at the Chief Signal Office, as follows:

Two details, one officer and one enlisted man each, are made daily for practice in all kinds of military signalling, including the heliograph, field telephones, and telegraphs, and for instruction and practice in military surveying, field sketching and mapping. All officers on duty in the office of the Chief Signal Officer, excepting the officers in charge of the Property and Disbursing and Indications Divisions, are required to take this field practice. The details of officers are made in rotation, from a roster containing the names of all the officers available. The practice is conducted under the personal direction of the Chief Signal Officer. Officers are required to furnish their own transportation.

On June 18, 1885, a division of Military Signalling was established under charge of an officer, whose duties are as follows:

The care and improvement of the field telegraph train, heliograph, knapsack-telephone and telegraph, and signal apparatus in general; the preparation of a manual for instruction in military signalling and management of the field-telegraph train; and the supervision of the

theoretical and practical instruction in signalling of officers and enlisted men at Fort Myer and at this office. To collate all information possible from American and foreign sources in relation to the foregoing subjects.

When necessary for practice or experiment, this officer should have the use of trains and signal apparatus and equipment at Fort Myer.

During the coming year it is intended to replace the old and worn-out signal equipments, now in use by the Signal Corps and at military posts, with new and approved appliances for visual signalling. Some slight progress was made in this direction during the months of May and June. A small manual for instruction of officers and men in signalling is in course of preparation.

It is the intention, also, to have constructed a section of field-telegraph train similar to the field train now used by the Swedish government, the wagons of which are smaller and lighter than those now used by the Signal Corps, and are therefore better adapted to the rougher roads in this country. Some of the wagons are at present being constructed. The pressure of the constantly increasing and expanding meteorological duties of the bureau has, since 1870, caused the purely military duties and responsibilities of the corps to be somewhat neglected, but it is now proposed to remedy this by vigorous study of the theory and practice of the art of military signals. It is proposed during the coming year to erect two permanent military signal stations with a good range between them of about fifteen miles, and to equip them with the latest and most approved apparatus for visual signalling. These stations will be used for practice and experiment, and will be located with a view to use in actual warfare. The subject of military signalling is at present securing special attention in the armies of Europe, and no labor or expense is spared in perfecting their equipments and field-telegraph trains.

The annual report of the officer in charge of Fort Myer, to which special attention is invited, accompanies this report as Appendix No. 1.

During the year four officers completed the course at Fort Myer, including a theoretical and practical course in cavalry tactics, customs of the service, manual of signals, cipher manual, military surveying, electricity, and electric telegraph. Thirty-one enlisted men were instructed in military signalling, telegraphy, elementary meteorology, and in their duties as soldiers and observers of the Signal Service.

In addition to the above, a course of instruction for officers charged with the preparation of weather predictions, the announcement of approaching frost, and the ordering of storm signals has been enlarged, and now embraces a course of lectures by the most distinguished professors of meteorology in this country.

A course of instruction in military surveying, field sketching and topographical drawing has also been added, with a view of increasing the efficiency of signal officers in time of war.

It is my intention, in time, to have all officers of the Signal Corps instructed in meteorology, but at present it is necessary to rely in part upon the services of officers detailed from the line of the Army, who have, by long experience, become proficient in the most important duties of this service. There are officers of the line who have been connected with the service some fourteen years, to whom the service and the country owe a great deal, who, in fact, have done the greater portion of the work which makes the service a necessity, and who ought to be retained in the corps, and it is believed that Congress during the coming session will recognize the importance of retaining these officers of long experience permanently with the corps.

The study of meteorology is greatly stimulated by the work of the Signal Service, and the popular interest in this subject has induced many of the colleges to add a course of instruction in meteorology as a part of the collegiate course. At many of these colleges young men learn of the field of usefulness which the Signal Corps offers, and from this source the service has obtained many excellent recruits.

In some cases lectures have been delivered during the year by professors and enlisted men of the service. To meet the demands for text-books on meteorology growing out of the increased interest in this subject, I directed Prof. William Ferrel, Assistant, to prepare a work that would comprise the best and most useful parts of all scientific papers which have been published. This paper will be found in Appendix No. 71.

This treatise contains the most appropriate and important of the various meteorological papers of original research on the subject of meteorology, presented by more popular methods, better adapted to learners than the methods in the original papers in which it was generally supposed that the reader was familiar with what had been previously published. This valuable work when issued will meet the wants of the colleges of the country by supplying a text-book containing the most advanced researches, and it is earnestly recommended that provision be made for its immediate publication.

Prof. Cleveland Abbe, Assistant, is charged with the preparation of a treatise on the theory of instruments used in meteorology, which, when completed, will serve as a valuable text-book for those wishing to pursue the study of meteorology. Arrangements have been made for the completion of an elementary text-book intended for the use of normal and high schools. These valuable works will be completed during the current year, and the office should be provided with the necessary means for their prompt publication.

The translation of valuable papers on temperatures and storms by Ragona and Wild, are appended. For the former I am indebted to the politeness of Rev. C. M. Widman, S. J., Saint Charles College, Grand Coteau, Louisiana.

The preparation of translation of important treatises on meteorology has been made, and other translations, giving the most recent and reliable results bearing upon the science of meteorology, will be completed during the coming year.

The enlistment of young college graduates, with a view of making them observers of the Signal Service, has been continued during the year with gratifying results.

This plan of securing for the service men of education and general intelligence has now been in operation four years, and of the three hundred and nine enlistments made during that time, eighty-six were college graduates. These young men are first placed under instruction and fitted for station service, and those showing capacity for special work are selected and instructed, with a view of qualifying them for the scientific work of the service.

INDICATIONS.

The weather forecasts, based upon tri-daily telegraphic reports, have been regularly issued during the year and, as an evidence of their practical value, they now form an important item of news for the associated press of the country. In a number of cases the daily papers are furnished with special forecasts to satisfy the demands of the public, and this office has been called upon daily to furnish special predictions in the interest of commerce, agriculture, and special trades.

The most important new feature of the indication work during the year has been the large increase in special indications for particular localities. These special forecasts are made daily at 1 a. m. and 10 a. m., for the succeeding day, for the principal centres of population, for lines of railroads and States, and are sent by special message to Signal Service observers, directors of State weather services, railroad officials, and editors, for the information of the public. At the close of the year this office was sending out regularly twenty-nine of these special messages, in addition to the regular indications, as follows:

AT MIDNIGHT.

- To J. F. Boyd, Chambersburg, Pa., railway signals.
- To T. B. Hutchinson, York, Pa., railway signals.
- To Professor Thomas, Columbus, Ohio, railway signals.
- To Professor Mell, Auburn, Ala., railway signals.
- To observers, Boston, Mass., and New Haven, Conn., indications for New England, to be displayed throughout that district by system of flags.
- To editors of "Richmond Dispatch," "Baltimore Sun," "Washington Post," "Republican," "Journal," "Herald," "Chronicle," "Capital," and "Gazette," for those cities and vicinities.
- To observers, Albany, Buffalo, Chicago, Cincinnati, Indianapolis, Louisville, Milwaukee, Saint Louis, and Toledo, for those cities and vicinities.
- To observer, Jacksonville, Fla., for northern Florida.
- To observer, Detroit, Mich., for Detroit and southeastern Michigan.
- To R. B. Gemmell, Topeka, Kans.
- To W. L. Cayle, Springfield, Mo., and observer, Leavenworth, Kans., for Kansas, Indian Territory and western Missouri.

AT 10 A. M.

- To observer, Omaha, Nebr., for Omaha and vicinity.
 - To observer, Little Rock, Ark., for State of Arkansas.
 - To observers, Augusta, Ga., and Atlanta, Ga., for State of Georgia.
- The number of these messages is increasing daily, and to satisfy the wants of the public it is probable that the general indications will be made for individual States and not for large districts, as they are now prepared.

The special bulletin has been issued daily, except Sundays, at 10 a. m. This bulletin contains a more general account of the meteorological conditions than it is possible to express in the limited space allotted to indications. It informs the public of approaching cold waves, storms, frosts, extreme temperatures, etc., and contains forecasts of the weather applicable to the succeeding thirty-two hours, or the following day. When practicable, the Indications Officer is required to make special weather forecasts for selected districts, at midnight, applicable to the succeeding forty-eight hours. With a view of giving the people of the Pacific Coast the full benefits to be derived from the Signal Service, special indications are now prepared for the districts on the Pacific Coast by an experienced officer stationed at San Francisco.

The following tables show the percentage of accuracy of the indications during the year. Each forecast of the several meteorological elements is carefully compared by the Indications Board with the conditions actually occurring during the time for which the forecast was made. The rules by which these percentages have been computed

have been revised, and the use of ambiguous language in the indications prohibited. With these improvements, the wording of the indications, and the rigid manner of determining the accuracy of predictions, I anticipate still further improvements in the work of this division.

An increase of stations in the West and Northwest and in British America would lead to still further improvement in this important branch of the Signal Service work. The reports received from stations located on the sea-coast telegraph line are, in some cases, of special value in preparing the storm warnings, and the benefits thus derived warrant the expenditures necessary not only to maintain this line, but to extend it along the Atlantic Coast from Nantucket to Florida.

Percentages of indications verified for the year ending June 30, 1885.

Districts.	1884.						1885.						Annual averages.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
New England.....	72.2	84.1	78.2	82.0	86.9	81.5	87.2	88.9	86.2	81.2	79.1	83.8	82.8
Middle Atlantic States.....	86.2	83.5	82.9	85.8	85.5	85.2	84.4	83.9	83.8	85.6	82.1	80.9	84.6
South Atlantic States.....	88.2	85.7	83.4	87.2	85.3	82.8	86.1	83.2	83.5	82.1	82.9	85.8	85.8
Eastern Gulf States.....	83.5	85.8	86.7	87.8	84.9	81.4	89.0	84.2	87.3	83.6	87.7	88.2	85.8
Western Gulf States.....	80.2	84.2	86.2	86.3	87.0	80.6	85.7	84.8	86.7	84.7	87.1	87.6	85.9
Lower Lake Region.....	84.0	82.8	77.4	79.1	85.5	85.2	87.9	83.7	86.8	81.0	79.7	87.7	82.6
Upper Lake Region.....	83.7	82.2	78.0	80.5	85.2	75.9	85.5	81.9	84.0	81.0	77.6	85.8	82.1
Tennessee and Ohio Valley.....	85.5	82.3	84.8	81.4	89.8	78.9	85.8	82.8	86.0	86.0	84.9	87.0	84.4
Upper Mississippi Valley.....	84.1	85.4	78.5	78.0	85.0	77.7	84.5	83.2	84.0	85.0	82.7	87.3	83.0
Missouri Valley.....	78.0	76.8	72.6	72.8	79.7	75.2	80.2	74.8	73.5	82.1	86.6	86.8	78.0
Monthly averages.....	81.8	83.2	81.5	82.2	85.6	79.8	84.1	82.6	82.7	83.8	82.6	87.3	83.6

The indications for the districts named in the above table were for character of weather, direction of winds, and changes of atmospheric temperature and pressure.

The following table shows the percentages of verifications for the Pacific Coast regions, the predictions from July 1, 1884, to April 9, 1885, being for character of weather only, and were made at the office of the Chief Signal Officer; those made after April 9, 1885, are for character of weather, direction of wind and temperature, and were made at San Francisco, by the officer in charge of the Pacific Coast Division of the Signal Service:

Percentages of verifications for the Pacific Coast regions for the months given.

Districts.	1884.						1885.						Annual averages.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
North Pacific Coast Region....	87.1	83.9	83.3	86.5	81.2	78.2	77.7	96.0	80.4	84.2	82.9	85.8	88.3
Middle Pacific Coast Region...	93.4	100.0	90.8	89.2	90.8	79.8	70.5	76.9	97.3	78.2	85.7	89.3	87.2
South Pacific Coast Region....	93.4	100.0	98.2	88.7	81.7	76.6	84.8	97.2	99.1	86.6	95.0	94.4	92.5
Monthly averages.....	84.6	84.6	90.8	85.4	87.9	78.2	76.7	90.0	92.2	83.0	87.7	89.7	87.6

The following table shows the number of cautionary signals ordered during the year ending June 30, 1885, with the number and percentages that were justified :

Month and year.	Cautionary signals.			Cautionary off-shore signals.			Cautionary north-west signals.			Total number of signals ordered.	Total number of signals justified.	Percentage of total number of signals justified.
	Number ordered.	Number justified.	Percentage justified.	Number ordered.	Number justified.	Percentage justified.	Number ordered.	Number justified.	Percentage justified.			
1884.												
July	122	97	79.5	23	14	60.9	None.	.....	.....	145	111	76.6
August	59	28	47.5	None.	.....	.....	None.	.....	.....	59	28	47.5
September	140	91	65.0	26	16	61.5	None.	.....	.....	166	107	64.5
October	205	149	72.2	42	33	78.6	41	20	48.8	288	202	70.1
November	200	182	91.0	91	78	85.7	None.	.....	.....	291	260	89.4
December	186	161	86.6	69	59	85.5	None.	.....	.....	255	220	86.3
1885.												
January	206	185	89.8	187	169	90.4	None.	.....	.....	393	354	90.1
February	160	150	93.8	77	70	90.9	None.	.....	.....	237	220	92.8
March	268	234	87.3	156	123	78.2	None.	.....	.....	424	356	84.0
April	183	149	81.4	37	29	78.4	None.	.....	.....	220	178	80.9
May	168	94	56.0	21	8	38.1	None.	.....	.....	189	102	54.0
June	126	119	98.2	62	44	71.0	None.	.....	.....	197	163	82.7
Total	2,082	1,689	80.7	791	642	81.2	41	20	48.8	2,864	2,301	80.3

Of the total number of cautionary off-shore signals displayed, 740, or 93.6 per cent., were justified as to direction, and 675, or 85.3 per cent., were justified as to velocity.

COLD-WAVE SIGNALS.

The following table shows the number of cold-wave signal displays, with the number and percentages justified :

Month.	Number ordered.	Number justified.	Percentage justified.	Month.	Number ordered.	Number justified.	Percentage justified.
1884—July .....	.....	.....	.....	1885—February	145	129	89.0
August .....	.....	.....	.....	March	80	70	87.5
September	8	2	25.0	April	76	66	86.8
October	74	57	77.0	May	22	25	75.8
November	106	106	99.1	June .....	.....	.....	.....
December	176	184	76.1	Total	946	815	.....
1885—January	246	226	91.9				

Of the 946 cold-wave signals displayed during the year, 815, or 86.2 per cent., were justified.

The work in this important division of the office requires special study and experience to insure the best results, and the assistants who are required to make these deductions should devote their whole time to meteorological study. The force available for the work is, however, so limited as not to admit of such assignments. The assistants who have had the most experience in the preparation of weather forecasts are officers detailed from the line of the Army, and if this service is to

be maintained it should not be deprived of the services of these officers, who have shown by experience that they are competent to perform this important work.

In Appendix No. 2 will be found the rules and regulations relating to the Indications Division.

Appendix No. 3 gives the report of the officer in charge of the Pacific coast weather service.

STATIONS.

The number of stations in operation June 30, 1885, in the United States was four hundred and eighty-nine. These include the telegraph stations, printing stations, display, special river, cotton region, sunset, and eight repair stations. In addition, reports are received from twenty-five Canadian stations, by the co-operation of the Canadian Meteorological Service. Telegraphic reports are received at this office daily from one hundred and sixty stations.

During the year sixteen full reporting stations have been established and two discontinued. In addition to reports received from regular stations, three hundred and seventy-five voluntary observers and Army surgeons at fifty-two military posts have furnished monthly reports, which have been used in preparing the current publications of this office. The office has continued to co-operate with foreign observers in collecting simultaneous meteorological reports, and in this work reports have been received from three hundred and thirty-three foreign stations and five hundred and sixty-five naval and merchant marine vessels.

Reports received from the above stations have been carefully compared and tabulated for publication, and these tables contain, not only the results of observations taken during the current year, but in some cases, the means of the several meteorological elements from observations taken since the establishment of the Signal Service. The meteorological tables accompanying this report have been so arranged as to give a complete meteorological history of each station. The weather, temperature, and rainfall for each month of the current year may be readily compared with the normal weather, temperature, and rainfall, and the effect of abnormal atmospheric conditions upon agricultural products may be determined. The report of the officer in charge of the Stations Division will be found in Appendices from No. 4 to 61, inclusive.

SIGNAL SERVICE AGENCIES.

Signal Service agencies have been maintained in New York City, Philadelphia, and Boston since November, 1884, with a view of increasing the usefulness of the Signal Service to the merchant marine, to secure a greater number of meteorological observations taken at sea by merchant vessels, to insure uniformity in the methods of making the observations, and to familiarize shipmasters with the signals displayed by this service to indicate the approach of dangerous storms.

The work assigned to this new division of the office has been carried forward with gratifying results under the immediate charge of Sergt. H. J. Penrod, Signal Corps, U. S. A., whose report is given in Appendix No. 62.

TELEGRAPH DIVISION.

The regular tri-daily cipher weather reports were received during the year over the wires of the Western Union, International Ocean, Florida, Gulf Coast, and Northwestern Telegraph Companies.

One million six hundred and thirty-nine thousand cipher words of weather reports were received at, and sent from, this office during the year. Seventy thousand two hundred and twenty-five telegrams, other than weather reports, were sent and received during the same period.

On account of the reduced rates for Government telegrams, including the reports sent over circuits, the service was enabled to largely extend the dissemination of weather reports and forecasts for the benefit of the public.

SEA-COAST TELEGRAPH LINE.

This line extends along the Atlantic Coast from Smithville, N. C., to Cape Henry, Va., and from Chincoteague, Va., to Sandy Hook, N. J.; it has proved of great value to shipping, and affords a means of rapid communication when assistance may be required. Portions of this line are now used as a telephone line by the Life-Saving Service, and in cases of wreck the crews of life-saving stations are enabled to more promptly reach the scene of the wreck. The value of this line to the Signal Service and to the shipping interest of the country is such as to require not only a liberal appropriation for its maintenance, but an additional appropriation for its extension along the coast.

This service has in a single year, by means of this line, saved property the value of which exceeded the entire amount appropriated for the support of the Signal Service. A contract has been made for the manufacture and laying of the cable to connect Nantucket with the mainland, and it is expected that telegraphic communication will be established with this island during the present year, thus adding to this service a most valuable station for the display of storm signals.

• UNITED STATES MILITARY TELEGRAPH LINES.

These lines have been constructed and operated by the Signal Service in unsettled portions of the country not occupied by commercial lines, and it has been the policy of this service to discontinue these lines as soon as commercial lines were constructed. The aggregated length of military telegraph lines now operated by this service is 2,779 miles, against 2,805 miles in operation at date of last report. The lines at present operated are distributed as follows:

	Miles.
Department of Dakota	893
Department of the Missouri	582
Departments of the Columbia and California	512
Department of Arizona	510
Department of Texas	197
Department of the Platte	85
Total	2,779

The accompanying map exhibits the various sections of United States military telegraph lines now in operation and those abandoned during former years.

The construction of the following new lines has been recommended by the respective department commanders, and will be included in the estimates for the next fiscal year, viz., from Fort Gaston, Cal., to the North Fork of Mad River, Cal., 28 miles; from Fort Halleck, Nev., to Halleck Station, Nev., 12 miles.

The lines have worked well, rendering valuable aid in military operations, and those in the Northwest have enabled the Signal Service to secure important meteorological reports from unsettled regions not occupied by commercial lines. I am indebted for the liberal assistance

rendered by the department and post commanders for aid in the operation and repair of these lines. As these lines are operated for the benefit of the Army at large, it is recommended that legislation be secured authorizing the permanent detail of fifty enlisted men from the line of the Army for duty with these lines, and the enlisted men, while so serving, to receive extra-duty pay from the line receipts. A detailed report of the officer in charge of the military telegraph lines will be found in Appendix No. 63.

BOARDS OF TRADE.

This service has continued its co-operation with boards of trade, chambers of commerce, and other commercial organizations in the principal cities throughout the country, and the many applications received from these organizations for an increase of the information furnished by this service indicates the importance of the work. These numerous demands cannot be fully satisfied with the means at the disposal of this service, and the important interests represented by these organizations calls for a more liberal support from Congress. Many of these organizations have appointed meteorological committees, which have proved important auxiliaries to this service, as they confer with the Chief Signal Officer and give information relative to the wants of the particular industries represented, and offer suggestions as to the best means of supplying those wants. Inspecting officers consult with these committees as to the character of the work performed by the observer and obtain reliable information, which enables me to determine whether or not the duties, so far as they relate to distributing information, are properly performed. A list of boards of trade co-operating with this service will be found in Appendix No. 64.

STATE WEATHER SERVICES.

The meteorological services organized in a number of States have continued to co-operate with the Signal Service with gratifying results. The New England Meteorological Society performed excellent service in distributing the weather forecasts and special predictions for that section over railroad, telegraph, and telephone lines. The State services in Ohio and Alabama have likewise aided in distributing the special predictions of this service over the lines of railroad in those States, these predictions being telegraphed from this office to the chiefs of the weather services at midnight. Similar arrangements are now being made with the chiefs of other State services for a wider distribution of the weather forecasts of this service. A list of the States in which local State services have been formed will be found in Appendix No. 65.

MISCELLANEOUS.

COLD-WAVE SIGNALS.

There is scarcely an industry which is not more or less affected by the sudden and marked fall in temperature. This service has long appreciated the value of forecasts which would give the public information as to the approach of cold waves, but it was not until late in 1883 that a definite system was inaugurated and signals displayed giving warning of the approach of these waves. This system of warnings met with immediate favor throughout the entire country, and the press, in most emphatic terms, indorsed the effort made by the service. All

branches of agriculture, extensive fruit dealers, cotton planters, officials of railroad companies, and others, expressed the greatest satisfaction with the warnings, and, in many instances, individuals have purchased flags and displayed them in towns adjacent to Signal Service stations. Railroads and telegraph companies have almost without exception co-operated with the service in distributing these warnings without expense to the Government. All means available are used by the service in giving publicity to the cold-wave warnings, that the greatest benefits possible may result from each forecast. During the present year this system has been greatly extended, the number of stations displaying the signal has been increased, but, owing to the very limited appropriation made for the Signal Service this office has only been able to furnish flags to regular stations and to pay the cost of telegraphing the warnings. An annual appropriation of five thousand dollars would enable me to extend this system of warnings over the greater part of the United States, and the benefits which would result from such warning induce me to earnestly recommend that an appropriation be made for this branch of the service. A detailed report, contained in Appendix No. 54, gives the stations at which cold-wave signals are displayed and evidence as to the practical value of these signals.

WEATHER AND TEMPERATURE SIGNALS.

A system of signal flags to indicate the changes in temperature and weather has been greatly extended during the present year. These flags are extensively displayed on lines of railroads and at railroad stations, and communicate the weather forecast made by this office to many who are unable to procure the printed indications. A full description of these signals and the extent to which they have been used is given in Appendix No. 55.

RAILWAY WEATHER BULLETINS.

The Signal Service furnishes the weather indications at a fixed hour to any railway company volunteering to transmit them over their lines without charge to the United States. This system of weather reports has proved a most valuable adjunct to the Signal Service. Many railroad companies have generously extended their aid, and the indications are daily posted at hundreds of small towns, villages, and stations throughout the country, and thus thousands of people are kept fully informed as to the probable conditions of the weather in localities where daily papers are not published. A list of railroads co-operating in this work will be found in Appendix No. 56.

FLOOD WARNINGS.

The system of river observations and flood warnings of the Signal Service has been greatly improved during the present year.

In November, 1884, special instructions were issued, in pamphlet form, for the guidance of river observers in erecting gauges, taking observations, rendering reports, etc. On January 1, 1885, the special river stations were arranged in sections and placed in charge of the Signal Service observers at section centres. These centres are usually located at some important city where the river reports in the vicinity can be most advantageously collected and published for the benefit of the river commerce. For detailed report upon this subject see Appendix No. 57.

COTTON REGION REPORTS.

The system of cotton-region reports inaugurated in 1881 has been continued, and the reports are considered of great value to the planters and to the cotton interest throughout the country. Reports of rainfall and maximum and minimum temperatures are promptly distributed daily from the districts centres, and all large cities in the South are supplied with this information. These reports are published in the newspapers and bulletins at cotton exchanges, where they are readily accessible to the business men and general public. Reports are collected and disseminated throughout the cotton region from April 1st to October 31st, each year; this year, however, owing to the small balance of the appropriation available for the purpose the observations were not commenced until May 1st. I have received numerous requests from those interested in these reports urging that they be made continuous throughout the year. These requests should be complied with, and I recommend that the appropriation for the cotton-region reports be increased from seven to twelve thousand dollars. A description of the cotton-region reports will be found in Appendix No. 58.

FROST WARNINGS.

The system of frosts warnings for the benefit of the tobacco, sugar, and fruit interests of the country has been continued during the year. Special attention has been given to the system of warnings for the cranberry interest in Wisconsin, Massachusetts, and New Jersey, and stations have been established which assure the prompt transmission of frost warnings to the threatened regions.

The railroads in the Southwest transmit by telegraph the warnings of approaching northers issued by this service. Efforts have been made to improve this service during the past year, and a cold-wave station has been established in southern Kansas for the benefit of the cattle interest in that section and in the Indian Territory.

SCIENTIFIC WORK.

STUDY DIVISION.

I am pleased to acknowledge the continued valued co-operation of the following consulting specialists in the prosecution of the scientific work of this service:

Prof. John Trowbridge, Cambridge, Mass.

Prof. H. A. Rowland, Baltimore, Md.

Prof. E. S. Pickering, Cambridge, Mass.

Prof. A. W. Wright, New Haven, Conn.

After receiving the favorable indorsement of many European meteorologists, the application of gravity correction to barometric observations was ordered, and the necessary tables were prepared for its introduction, on January 1, 1885. Improved tables for the reduction of barometric pressure to sea-level have been prepared and submitted for adoption in place of the monthly constants now in use. Before making this change it has, however, been thought advisable to refer the subject to the attention of various foreign meteorologists and national weather services, hoping thereby to bring about a greater uniformity in the practical treatment of this important matter.

The question of the proper exposure of thermometers has been carefully considered, and a report on the work thus far accomplished is ready for publication. As a practical application of the results of these in-

vestigations, much attention has been given to the locality and environment of thermometers at all Signal Service stations, and many improvements in their exposures have been made. On January 1, 1885, the time of taking all simultaneous observations of this service was advanced eight minutes, so that these observations are now taken on the even hours of standard time. This change in time was made in conformity with the recommendations of the International Prime Meridian and Time Conference, held in this city in October, 1884. The collection of data relative to tornadoes has been continued, as in past years, and a report on the tornadoes of 1884 has been published. A corps of voluntary tornado reporters send in accounts of all destructive local storms and receive in return the publications of this office bearing on this subject.

The special observation and study of thunder-storms began last year, has been carried on with valuable results. About 15,000 reports from 2,500 observers have been received. Monthly summaries of thunder-storms are compiled for insertion in the Monthly Weather Review, and a report on the thunder-storms of May, 1884, has been published as a Signal Service Note.

The compilation of a general bibliography of meteorology has been continued, and about forty-five thousand titles have been collected, twenty thousand having been added during the past year.

This catalogue will be enlarged, and the work of subject classification completed, during the coming year, thus rendering available for the work of this office an approximately complete index to meteorological literature.

The completeness of the bibliography is due, largely, to the earnest co-operation of meteorologists and librarians throughout the world, many of whom have contributed special bibliographies for their respective countries; this fact, added to its great value to all students of meteorology, renders the immediate publication of the work a matter of the highest importance.

By an arrangement with Prof. S. A. King, aeronaut, of Philadelphia, five balloon voyages have been made for the special objects of studying the distribution of temperature and moisture. The service is indebted to Professor King for doing this work without other remuneration than payment of actual expenses. The records of all his voyages, about two hundred and fifty in all, are now being examined for compilation of meteorological results.

A general report on the water supply of the Yellowstone Park has been prepared, showing that, as nearly as can be estimated, the local rain and snowfall furnishes all the water required for the observed amount of flow of geysers, discharge of rivers, and evaporation.

Prof. Cleveland Abbe, Assistant, has continued in charge of this division, and his detailed report of work performed is given in Appendix No. 66.

PHYSICAL LABORATORY DIVISION.

In January, 1885, a division known as the Physical Laboratory Division was organized. This includes the division formerly known as the Meteorological Observatory, and in addition to the custody and care of the instruments, their comparison and adjustment with standards, etc., there was assigned to it the duty of establishing and maintaining a laboratory to which all questions involving experiment may be referred, and in which improvements in methods and instruments may be tested and developed.

In this division the regular work of comparison of thermometers and barometers with the standards of the service has continued during the year. Nearly two thousand barometers have been compared, including about three hundred belonging to private individuals. About two hundred barometers have been repaired, compared, and issued to stations, besides a large number of anemometers, wind-vanes, etc.

The final determination of the standard of thermometry is only delayed by the non-arrival of a few thermometers specially made and compared at low temperatures with the Kew standards. Junior Professor Russell has completed the preparation of a paper discussing the whole question, which will be ready for publication as soon as comparison of these instruments with our own standards can be carried out.

The investigation of the question of hygrometry has been continued. For the purpose of throwing light on some very important points, Junior Professor Marvin was sent to Pike's Peak in March, with instructions to carry out a series of observations at Colorado Springs and on the summit of the mountain. The results, which are being discussed by Professor Ferrel, promise to add much to our information upon this subject.

Several methods of observing underground temperatures have been studied, and it is believed that important improvements in thermometric devices have been discovered. Arrangements are being made for observation of earth temperatures at several points during the coming year.

Studies of the electrical condition of the atmosphere have been continued at Baltimore and Cambridge, and lately at the office in Washington. A continuous photographic record has been maintained at Baltimore. It is my intention to increase the number of stations for the experimental study of this important question as soon as I can determine upon the most practicable forms of apparatus.

Among other problems which have been considered in the laboratory, in addition to the above, may be mentioned the determination of the relative sensitiveness of thermometers with spherical and cylindrical bulbs, when used wet or dry; a determination of the limits of speed necessary in the whirled wet-bulb psychrometer, and a study of the degree of accuracy with which the attached thermometer represents the mean temperature of the mercury in the barometric column.

There is a large class of meteorological phenomena that cannot be investigated by means of the data furnished by the regular observations taken at the regular Signal Service stations, and with a view of obtaining these desired data I have submitted estimates for the construction of suitable buildings and the purchase of necessary instruments for a meteorological observatory and physical laboratory at Fort Myer, Virginia. Many of the instruments necessary for such an observatory are at present in the instrument room at this office, but in the present building no suitable place can be found for mounting them. This service is greatly in need of a first-class meteorological station, where hourly observations may be made of the meteorological elements, or self-registering instruments mounted so that hourly readings of the instruments may be obtained from the records. This observatory should be located at Fort Myer, Virginia, the present school of instruction for the Signal Service, as it affords an excellent exposure for the instruments and would serve as a training school for observers of the Signal Service.

A detailed report of Prof. T. C. Mendenhall, Assistant, in charge of the Physical Laboratory Division, will be found in Appendix No. 67.

ARCTIC WORK.

During the last fiscal year Lieutenant Greely has submitted his formal report concerning the operations of the Lady Franklin Bay Expedition. He properly decided, in view of the great public interest in his work, that it was better the formal report should be submitted at the earliest possible moment without delaying it for further preparation and elaboration of the scientific appendices.

As far as his limited means would permit he carried out the scientific programme of the Hamburg International Polar Conference, and brought back with him in safety an unbroken series of meteorological, tidal, magnetical, and other observations, which cannot fail to be valuable contributions to the international scheme.

The large number of careful pendulum observations made under favorable conditions, with corresponding time observations, have been transmitted, for reduction and discussion, to the Superintendent of the United States Coast and Geodetic Survey, to whose initiative and expense these valuable observations are largely due.

Elaborate and unbroken series of tidal observations at Fort Conger, supplemented by simultaneous series at six other points in the Arctic Ocean and Robeson Channel, have been submitted to the same official, and it is hoped that through these observations the co-tidal lines of the Polar Ocean and Robeson Channel may be satisfactorily determined.

The Chief Signal Officer has also intrusted to the same department the detailed magnetical observations, which involved over one hundred and fifty thousand separate readings of instruments, for reduction and discussion. •

The meteorological observations, including sea temperatures and soundings, as well as valuable observations on the velocity of sound at low temperatures, have been arranged and treated, as fully as the time would permit, by Lieutenant Greely.

Other scientific appendices have either been treated by that officer, or through his efforts have been elaborated by scientific gentlemen whom he has interested in his collections.

The lack of any appropriation for the preparation of these reports has necessarily resulted in these discussions being made gratuitously. Their hearty co-operation, thoroughly in accord with the true spirit of scientific inquiry, merits for these gentlemen the cordial thanks of this bureau.

Beyond the scientific work done in accordance with the outlined programme, the expedition further distinguished itself by supplementary work in the way of geographical discovery. It should be noted to the credit of the expedition that the scientific work was never in any manner neglected in the interest of field-work. The geographical work, considering the force employed, the lack of funds for their proper equipment, and the physical difficulties from shortness of season and the unfavorable ice conditions in such high latitudes, is probably unequalled in the annals of Arctic exploration. The extent of the work done may be best shown by the statement that it covered nearly three degrees of latitude, and above the eightieth parallel reached over one-eighth of the circle of the globe.

In the autumn of 1881, Lieutenant Greely succeeded in establishing several depots for future journeys, and in extending the work of exploration in the vicinity of his winter quarters. During the spring and summer of 1882, besides the many short trips of exploration, four im-

portant journeys were made. The first, under Doctor Pavy, attempting to discover land northward of Cape Joseph Henry, failed through the disintegration of the polar-pack, which left the party drifting for a day just south of the eighty-third parallel. Two trips of Lieutenant Greely himself, one in the spring and the other in the summer, resulted in the successful penetration and exploration of the interior of Grinnell Land. The farthest point reached in Lieutenant Greely's second trip was the summit of Mount Arthur, from which he discovered the northern portion of Grinnell Land to be covered by an ice-cap of probably six thousand square miles area, which pushes southward, in the form of glaciers, through all the valleys of two mountain ranges, named Garfield and Conger. These glacial off-shoots feed a large lake, of over three hundred square miles area and at an elevation of five hundred feet above the sea. This lake, named by Lieutenant Greely after the Chief Signal Officer, drains by a considerable river through Chandler Fiord into Lady Franklin Bay. The valleys adjoining the lake were found covered with an unusually luxuriant vegetation, which afforded sufficient pasturage for large herds of musk-oxen.

The discoveries of the ensuing year showed a large ice-cap to the south of the fertile belt of his farthest west. These explorations consequently revealed remarkable physical conditions in Grinnell Land, which have been hitherto unsuspected, i. e., a series of fertile valleys extending from Robeson Channel to the western Polar Sea, hemmed in to the northward and southward by ice-caps of immense thickness, which feed glacial lakes of considerable extent, drained by rapid rivers into the Polar Ocean.

Professor Nordenskiöld hoped for but failed to find similar physical conditions in Danish Greenland, nearly a thousand miles south of the point where Lieutenant Greely found them in Grinnell Land.

The most brilliant expedition of the year was that of Lieutenant Lockwood, who was charged by Lieutenant Greely with the exploration of the north coast of Greenland. Lieutenant Lockwood during an absence of sixty days, travelled with sledge nearly a thousand miles, and succeeded in reaching, with Sergeant Brainard and Eskimo Christiansen, May 13, 1882, Lockwood Island, latitude $83^{\circ} 24' N.$, longitude $40^{\circ} 45' W.$, whence he saw, fifteen miles to the northeast of his farthest land, Cape Washington, in about $83^{\circ} 35' N.$, $38^{\circ} W.$

Lieutenant Lockwood commended in the highest terms the energy and good judgment of Sergeant Brainard, and also the remarkable manner in which the supporting party, consisting of Sergeants Jewell, Ralston, Lynn, Elison, Corporal Sailor, and Private Frederick did their portion of the work.

The general results of Lieutenant Lockwood's work may be summed up, not only in the fact that he advanced the American flag to an unparalleled latitude, but that he carried Greenland over forty miles of latitude northward, and over ten degrees of longitude to the eastward of the extreme point which had ever been seen by his predecessors. He added over a hundred miles of previously unknown coast, which consists of precipitous highlands, intersected by broad deep fiords of unknown extent. Lieutenant Greely points out, as a gratifying feature, the entire freedom of the party from sickness or disaster of any kind. He further says:

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In accomplishing this work Lieutenant Lockwood displayed a remarkable amount of energy, courage, and perseverance. His success, which I cannot judge as otherwise than as grateful to the country, was won only by great endurance and much physical

sufferings on the part of himself and his party. I cannot do otherwise than especially invite the attention of the War Department to his work, and commend his memory to the most favorable consideration of his superiors. His labors in extending northward the limits of Greenland, and later in determining the western outlines and the interior conditions of Grinnell Land, resulted in important additions to our knowledge of the physical features of that part of the Arctic Circle. His work reached from Cape Washington, 38° W., to Arthur Land, 83° W., thus covering above the eightieth parallel one-eighth of the circle of the globe. He worthily upheld the honor of the American for courage, energy, and perseverance. If his tragic fate awakened the sympathy of the world, none the less should his successful work receive recognition. He unfortunately did not return for merited promotion.

Under similar circumstances it would have seemed grateful had my death and services been announced to the Army in general orders, and such tribute, I trust, may yet seem proper to Lieutenant Lockwood's memory.

He also acknowledges the extraordinary energy and determination of the supporting party, and the remarkable adaptability shown by them for the work. After quoting Lieutenant Lockwood's remarks of commendation, Lieutenant Greely adds:

It is justice to add that Sergeant Brainard was, of necessity, repeatedly assigned by me, in connection with the work of the expedition, to an officer's command, and that his conduct was uniformly such as to win commendation. Apart from his valuable service in the field I believe that he possesses qualities which merit reward and which would render his promotion to the grade of second lieutenant most suitable. I heartily recommend such promotion.

In 1883 Lieutenant Lockwood's attempt to further explore the Greenland coast was carried out with remarkable rapidity until he was obliged, by the disintegration of the polar-pack in the neighborhood of Cape Bryant, to return to Fort Conger.

During this trip Sergeant Brainard and Eskimo Christiansen narrowly escaped being set off in the Polar Sea by the breaking up of the pack.

Later in that year Lieutenant Lockwood, sent by Lieutenant Greely to attempt the crossing of Grinnell Land, succeeded, *via* Archer Fiord and Beatrix Bay, in striking a series of valleys which enabled him to cross the divide and strike salt water in Greely Fiord, which opens to the westward into the Polar Sea. From his farthest point Lieutenant Lockwood saw a distinct cape (Cape Lockwood), which was believed to be on a new land, which was named, after the President of the United States at that time, Arthur Land.

This highland probably consisted of the same mountains which were seen in that direction by Lieutenant Greely the preceding year, from the summit of Mount Arthur, forty-five hundred feet elevation.

The most striking result of Lieutenant Lockwood's trip was the discovery of a remarkable ice-cap which covers the interior of Grinnell Land to the southward. This ice-cap, named by Lieutenant Greely Mer de Glace Agassiz, presented for over fifty miles as a front an unbroken wall of ice averaging one hundred and fifty feet in height, broken only at two places sufficiently to permit a possible ascent. Lieutenant Greely says:

During this journey Lieutenant Lockwood and Sergeant Brainard displayed energy, endurance, loyalty, and pluck which was hardly second to their record of the previous year on the shores of the frozen Polar Sea. For nearly a week the entire party lived on less than half rations in order to render as complete as possible their work of exploration and discovery.

Lieutenant Lockwood's loyalty in this matter impressed me with particular force. He had deemed the crossing of Grinnell Land an impossibility, and in starting out had entreated me to permit him instead to examine the glacial system of Lake Hazen.

His persistency, energy, and fidelity in attempting the route from Beatrix Bay, after failing in Ella Bay, evidenced most strongly his determination that his commanding officer's idea of the practicability of the crossing of Grinnell Land should not fall through him.

The brilliant geographical work of the second year was accomplished despite the recommendation of his surgeon to Lieutenant Greely that he should abandon work of that character on the ground of possible accidents. Lieutenant Greely's letter (enclosure No. 63 to his report) indicates the proper spirit on the part of an officer and soldier charged with important and dangerous work.

Provision for retreat was not neglected for geographical work. Despite the same medical objections Lieutenant Greely wisely accumulated, as early as February, a store of provisions at Cape Baird, which was later used during his retreat. These stores were supplemented later by other supplies and also by the addition of the English boat, which had been brought by Sergeant Rice and party from Thank God Harbor during April.

On the first of August the party was completely prepared for a retreat in case no vessel should reach them during the ensuing week.

The two years' work of scientific observations and geographical explorations were made successfully, without sickness or disaster, as is shown by the following extract from the report:

* * * * *

The condition of the party for the coming retreat was one of general strength and health, despite their arduous labors of two years amid unequalled cold and darkness. Of the seven hundred and twenty-one days spent at Fort Conger, two hundred and sixty-eight days had been marked by the total absence of the sun. On two hundred and sixty-two days one or more sledge parties had been absent in the field, on journeys entailing from two to sixty days' absence, and some three thousand miles have been traveled by such parties. An unequalled latitude to the north had been attained, to Greenland over a hundred miles of new coast had been added, and to the westward Grinnell Land had been crossed, its interior surveyed, its physical geography determined, and the contours of its northern half fixed with considerable certainty. This geographical work had been done without disaster, without physical injury to any one, and for its prosecution no part of the scientific work for which the expedition was formed had been neglected or abandoned.

The programme of observations had been carried out as fully as instruments and circumstances would permit, and during the two years there had, on an average, been made and recorded daily fully five hundred observations.

In accordance with his instructions, Fort Conger was formally abandoned on the 9th of August, the earliest moment at which Archer Fiord could be crossed. The attempt, even at that early date, nearly caused the destruction of the launch. By indomitable energy the party, in twenty days' time, with their boats reached Cape Hawks, at the southern extremity of Dobbin Bay, in sight of Cape Sabine. They had been delayed by fog, violent gales, densely packed floes, and at one point were four days embayed by new ice. Their boats were almost hourly in danger of destruction, and serious nips were of frequent occurrence.

Of the Cape Hawks depot taken up by him, Lieutenant Greely says:

The depot consisted of three hundred and forty-two pounds of stearine, one hundred and sixty-eight pounds of preserved potatoes, about six gallons of rum, and some two hundred and fifty pounds of bread. Fully nine-tenths of the bread had spoiled since our previous visit, and, owing to the grave uncertainty of the future, the entire amount was carefully examined for such as was serviceable, and a considerable quantity of that taken was so mouldy that it was barely eatable. In connection with subsequent events it may, perhaps, be properly stated that not exceeding a hundred pounds more of bread could possibly have been selected from the unserviceable amount left, and all of this was permeated and covered by a slimy, green mould, which rendered the bread unfit for any one, and eatable only by a starving man.

To supplement our small amount of coal, then reduced to about four hundred pounds, all the casks at Cape Hawks were broken up and taken on the launch, to be used for steaming purposes.

We left Cape Hawks at 4.25 p. m. and ran southwest nearly an hour, finding the old ice increasing in amount and in places cemented thickly together with young ice. My judgment at the time of the situation is best shown by a literal quotation from my journal of that date: "I cannot but feel that we are now in a critical situation, not knowing what can be depended on. Since no vessel reached this point in 1862 and 1863 (to this time), we must all feel an uncertainty as to the party for our relief being at Life-boat Cove."

On August 28th the boats were beset in attempting to reach Victoria Head from Cape Hawks.

On September 10th Lieutenant Greely, abandoning his launch and one boat, endeavored to reach Cocked Hat Island, about eleven miles distant. Severe gales on two occasions, when they were almost within reach of shore, drove them into the middle of Kane Sea, and only after thirty days' exposure on the moving pack did they succeed in reaching land at Eskimo Point, in Baird Inlet.

The journal of Lieutenant Lockwood confirms fully the statement that Lieutenant Greely persisted in his purpose to reach the Greenland coast from the drifting ice-pack, despite the unanimous opinion of his officers and men to the contrary, and that he attempted to reach the Ellesmere coast only when the action of the elements had made such course the only practical one. Had he been able to carry out his plans he would have reached the Cape York natives, where he could have wintered. I had expected Lieutenant Greely would succeed in doing this, and in it was my hope for his safety. In this particular only, and by no fault of the party, has it failed me in any of my expectations.

The retreat by boats from Fort Conger to Cape Sabine may well be called the most remarkable boat journey of the age, and well justifies the encomiums passed on it by a high English authority on Arctic ice navigation, as a journey demanding unusual powers of executive ability and as evidencing remarkable capacity for command. The route along the coast was three hundred miles in length, but the tortuous course followed, necessitated by the ice-conditions, entailed over five hundred miles' travelling. This journey was made through straits and seas filled with ice of remarkably heavy character, the navigation of which is always most dangerous, and frequently destructive. It is evident that such a journey could only be made by a combination of prudent and daring measures, by the result of which the commander must stand or fall. Whatever inexperienced critics may characterize as errors, it none the less follows that Lieutenant Greely brought in health and strength his entire party, and in safety all the records and important scientific instruments connected with his two years' work, to the appointed place at Cape Sabine, and, but for the rashness with which the "Protens" was forced into the ice, the entire party would have returned in health.

Lieutenant Greely outlines the condition of affairs during the retreat, and at the time of landing, as follows:

The general conduct of the party during the exhausting labor necessary in constructing stone huts, as well as during our dangerous drift on the ice-pack, was exceedingly creditable. It was but natural that great physical sufferings, from lack of proper shelter, continued excessive work, and insufficient food, should react on the mind, and cause murmurs and discontent, which at times broke into indiscreet remarks and reflections. This impropriety was only on the part of a few members, and as detailed in the attached journals of Lieutenant Lockwood (written in shorthand at the time) and Sergeant Brainard. Fortunately the party, as a whole, was never otherwise than subordinate and united. That subordination had been our safety in our four hun-

dreced miles travel, which had ended in the party of twenty-five landing in health and strength, with records and instruments safe, on the barren coast of Ellesmere Land.

This courage, good behavior, and loyalty may theoretically seem a matter of course in the common interest, which could be subserved only by unity and harmony, but when death, starvation, and great physical suffering impend, the temptation for the strong to appropriate all and sacrifice the weak is certainly very great. * * *

The preservation and successful transportation of his records and instruments to Cape Sabine resulted from Lieutenant Greely's forethought and systematic arrangement of them to this end. His strong determination to save these doubtless had some effect in producing a corresponding spirit in the men, as evidenced by their unanimous action regarding the abandonment of the pendulum. Lieutenant Greely says:

The pendulum being a heavy and cumbersome instrument, I informed the men that while the saving of it was much to be desired from the value of subsequent comparative observations, yet it could not weigh against the chances of any man's life, and that whenever any one thought his life endangered by hauling it, or any one insisted on its abandonment I would do so. To the credit of the party no man ever hinted at the abandonment, and most of them were outspoken for its retention to the last. * * *

Pending report of men sent out to learn the condition of affairs at Cape Sabine, winter quarters were erected at Eskimo Point.

As Lieutenant Greely had abandoned one boat on September 12th, in deference to the unanimous recommendation of his officers and men, but one boat remained, preventing any movement until he learned, on October 9th, that three other boats were within his reach on the same coast. There is no desire on the part of the Chief Signal Officer to enter into any detailed discussion of certain phases connected with this expedition which have engaged the public attention, and unfortunately assumed in some measure a form of controversy. •

Lieutenant Greely's report is confined entirely to facts which were within his knowledge while at Cape Sabine, and he carefully avoids committing himself to any theory as to the line of conduct which should have been followed by Lieutenant Garlington or others. .

The facts in this report speak for themselves, and, limited as they are to a plain statement as to the condition of affairs and the effect produced by them on his future action, need no elaborate treatment or comment.

The following extracts from his report covers the condition of affairs at Cape Sabine, as developed on his arrival there:

The 9th of October was an eventful day to the party; Sergeant Rice returned bringing us news. He brought the record of Lieutenant Garlington, dated July 24th (Appendix No. 116), which informed us of the sinking of the "Proteus" on the 24th, and that Lieutenant Garlington and her crew had gone to the east coast to communicate with U. S. S. "Yantic" or a Swedish steamer. Rice discovered three caches; the English one of two hundred and forty rations; the Beebe cache of two hundred and forty rations; aggregating four hundred and eighty rations; and the wreck cache, which, from Lieutenant Garlington's report, contained five hundred rations of bread, sleeping-bags, tea, and a lot of canned goods. The record further said: "Cache on Littleton Island and boat at Cape Isabella." The words "two hundred and fifty rations" contained in Lieutenant Garlington's copy as furnished to the court of inquiry, was not in the original record.

The modification of Lieutenant Garlington's record is referred to, as the record left had an important bearing on my subsequent actions. The record informed me of the disaster to the "Proteus," and Lieutenant Garlington's positive assurance that "everything within the power of man to rescue my party would be done."

His declaration that he left for the east coast to endeavor to open up communication and pointed out that if the "Yantic" failed him a Swedish vessel was possible, were construed as conveying to me in the strongest terms his fixed determination to return to Cape Sabine if either steamer was fallen in with, and I could look to him for relief.

Two courses were open to me. One to proceed to Cape Sabine, await possible assistance thus promised, and, if it did not come, to cross to Littleton Island by sledge as soon as the channel should close.

Those who are inexperienced in the varying phases of Arctic ice-conditions cannot clearly understand why Smith Sound crossed in whale-boats during July should be impossible for similar boats in October. In July, with its ever-present sun, Smith Sound is generally an open sea free from ice, but in October, 1883 it was filled with floes and ground-up ice, continually driven about by heavy tides and severe storms, while the scant six-hour sun of October 10th disappeared entirely for the winter only sixteen days later.

Our experience of the previous thirty days had shown the impossibility of crossing the upper part of Smith Sound, owing not only to the large quantities of heavy ice moving southward, but particularly on account of the prevalence of rubble and slush-ice, among which young ice was continually forming, which would neither permit the passage of a boat nor bear the weight of a man.

Our experience had been somewhat similar to those of naval expeditions under like conditions. The drift party of the "Polaris" had been unable, in that channel and in sight of that very spot, to make land but a few miles distant; failing, says the official narrative, "despite the most persistent efforts." On the east coast of Greenland the crew of the "Hansa," in January, 1870, had been unable to reach shore but two miles distant, although their lives appeared to depend on their success.

Two months before, to a day, a powerful vessel of the Navy had been forced out of the lower and less dangerous portion of this sound, owing to the dangers of its navigation.

By extraordinary exertions and fortunate circumstances we had been able to make land twelve miles off, without sacrificing, as did one of these parties, their entire scientific collection.

In consequence of this condition of affairs, a movement to Cape Sabine meant a permanent camp until relief could come by vessel that fall, or the straits freezing over to permit crossing by sledge. The second course was to turn our faces homeward, and taking the second boat at Cape Isabella, push southward to Clarence Head along the west coast, and from that point attempt the Cary Islands, where we would be safe, or, the ice-conditions precluding that course, in desperate strait, push still southward in the hopes of being able to cross Jones and Lancaster Sounds and reach Pond Inlet.

Smith Sound, from Isabella southward, opens like a fan, so that, necessarily, the ice spreading in early fall leaves large water-spaces, which freeze over at a very late date, if at all. During our stay at Eskimo Point, the ice had frequently opened up so that a voyage could have been made by boat to the southward, and by ship across Smith Sound to the eastern shore. As far north as Cape Isabella, Smith Sound was navigable for ships most of the time until after November 4th. In short, the ice was a pack, changing with every wind and tide, which was fringed with young and slush-ice, though in general not of a heavy character.

The prevailing sentiment of the party plainly favored a movement to Cape Sabine, where all possible help was pledged, and I decided on my own responsibility to move to that point, reluctantly turning my back to the southern trip, which might have involved the entire destruction of the party or have secured its ultimate safety.

This report of facts confirms the opinion already put forth by the Chief Signal Officer in his statement to the Proteus Court of Inquiry, that the record left at Sabine, holding out promises of assistance, had an important, if not disastrous, effect upon Lieutenant Greely's subsequent action, since these promises were not fulfilled, but led to a false security. It also confirms the soundness of the Chief Signal Officer's judgment in recommending an autumn expedition in 1883. The terms of Lieutenant Greely's report show that Smith Sound, as far northward as Cape Isabella, was navigable into the early days of November.

It is further clearly shown why Smith Sound could not be crossed by Lieutenant Greely, and what has been overlooked by many is pointed out, that he had four boats within reach in the neighborhood of Cape Sabine.

As regards the small depot at Isabella, extraordinary exertions were made to secure it, and it was brought in November to the middle of Baird Inlet, where it was abandoned to save the life of a frost-bitten

member of the party, Sergeant Ellison, who later died from injuries received in that journey. A similar attempt the ensuing April resulted in the death of Sergeant Rice.

The whole report shows a remarkable husbanding of strength, food, and fuel, which had important results in preserving the lives of the survivors.

The spirit of courage, subordination, and discipline which prevailed at Sabine among the party, was doubtless due to Lieutenant Greely's programme of systematic living, amusement, and occupation. That he was ever mindful of the scientific character of the expedition is shown by the following extract:

On the 4th of November regular barometer observations were commenced, from a barometer abandoned by Lieutenant Garlington at Cape Sabine, and these observations were made every four hours from 7 a. m. to 7 p. m., until the instrument was broken, about three weeks before the final rescue of the party. Gaps in the record necessarily occurred towards the latter part of the time, owing to the diminishing strength and deaths of the observers. During the winter months of total darkness the thermometer was rarely read, except at 11 a. m., as I was unwilling to subject any member of the party to unnecessary exposure, even in the scientific interest of the expedition.

The last temperature and weather observations were made forty hours before the rescue.

The fact that the centre of Smith Sound remained open the entire winter prevented any crossing by sledge to the eastern coast, but an attempt was made to communicate, which resulted as follows:

On February 6th Sergeant Rice and Jens returned about 2 p. m., well, but thoroughly exhausted, especially the Eskimo. Sergeant Rice reported that open water extended from ten miles off Wade Point and a mile off Brevoort Island, as far north into Kane Sea as the eye could reach. At no time was the Greenland shore visible. There was much moving ice, with dense water-clouds along the edge of the fast ice. He thought he reached a point as far south as Littleton Island, and about ten miles distant. The two men suffered very much, as may be supposed, the temperature being from -18° to -36° , with one severe storm.

Late in March Lieutenant Greely, in hopes of obtaining game from Alexandra Harbor, some twenty-five miles westward of Camp Clay, sent Private Long and an Eskimo to that point. A thorough search showed that no game had wintered there that season.

During this trip Private Long reached a point which enabled him to extend the southern part of Hayes Sound some twenty miles further to the westward than ever before known. With a view to this work, Lieutenant Greely had carefully instructed Private Long before the trip, in order that such journey might not be fruitless in contributing to the object for which the expedition was planned. The spirit which animated the expedition in regard to scientific work is shown by the following extract:

The variability of spirits and the indomitable courage of the party were evidenced by Sergeants Brainard, Jewell, and Israel volunteering to go into Hayes Sound for geographical explorations in May in case Long succeeded in obtaining game, and later the doctor added his name. I had talked much of sending a party into that sound in May for the purpose of exploration, more to encourage the men than for any other purpose, and such discourse and planning appeared to have borne good fruit.

During the autumn several small seals were obtained, in March nearly a hundred pounds of birds, and in April a young bear. This meat, together with about twelve hundred pounds of shrimps and sea-weed (largely obtained by Sergeant Brainard) and the addition of the seal-skin clothing, saxifrage, and such roche de tripe lichens as could be gathered, supplemented their food supply.

One death from disease occurred in January, followed by many deaths of starvation in May, which, checked by the capture of the bear, commenced again the middle of May, and continued to the end.

Where the facts in the case have made it incumbent on Lieutenant Greely to mention breaches of discipline and misbehavior on the part of any member, the moderate and impartial tone taken by him cannot but be remarked. When the sense of official duty has not required expression, he has spoken kindly or not at all, but has left all unimportant matters to be described in the journals of Lieutenant Lockwood and Sergeant Brainard, as he well says, "by a dead and by a living witness."

In connection with the last year, Lieutenant Greely says:

In regard to the general conduct of the expedition during the year after leaving Fort Conger, any impartial critic must speak of it in terms of commendation. Courage, patience, and fortitude characterized all, both living and dead. If, in a few cases, impatient spirits gave expression to indiscreet and insubordinate utterances, yet such feelings vented themselves in words, without demoralizing the party or weakening the bonds of discipline which united us as a whole.

As to cases where men were guilty of appropriation of the food of others to themselves, I bear in mind now, as then, the great temptation which slowly starving men must experience when food is within their reach. The spirit of conciliation and forbearance which I so long exercised while such a policy seemed possible without fatal results, was followed by the execution of Private Henry, which the exigency of the case demanded. I attach herewith, as appropriate appendices, the orders in the case, as well as a previous report to the honorable the Secretary of War, and his reply approving my course in the matter. (See Appendices 128, 131, 132, and 133.) It was only after repeated thefts that this terrible retribution fell upon Henry. The execution was regarded by me simply in the light of a self-defense for the remnant of my party and myself. While deeming the punishment merited, I appreciated fully the tremendous temptation it was to a man like Henry (who was, as he acknowledged himself, devoid of moral principles) to take that which was before him, and which would, in a measure, satisfy him physically.

As to other matters which have engaged an undue share of public attention, while having no official knowledge of the facts in the case, yet the responsibility for action in connection with such an expedition rightfully and properly rests upon the commanding officer.

In assuming the responsibility in that connection, I know of no law, either human or divine, which was broken, and so do not feel called on as an officer or a man to dwell longer on such a painful topic.

In Appendix No. 134 will be found the dates and causes of death of the various members of the expedition.

I should be unjust to the dead, whose arduous labors, heroic endurance, and unflinching determination advanced the national ensign into an unparalleled latitude, carried out the programme of international scientific observations, increased perhaps in an unequalled degree in this century our knowledge of the physical characteristics and configurations of polar lands, and who, more than all, in the most remarkable boat journey of the age, brought safely, at the price of great bodily suffering and diminished chances of life, through a dense polar-pack, these records to a point whence they would eventually reach the world. They died for that end, and should not be forgotten.

It would be equally unjust not to mention the services of the living. The lack of precedent forbade the War Department from confirming appointments and promotions made by me in the exigencies of my position. The necessity of maintaining the dignity of the service likewise interfered to their detriment when public interest was in a way rewarding them with moderate fortunes.

Two of these men, Hospital Steward Henry Biederbick and Sergeant J. R. Frederick, have been discharged the service on surgeon's certificate of disability; and in a maimed condition are adventuring the gain of their livelihood. The three remaining are now members of the Signal Service, on application of the Chief Signal Officer. As a reward in some way commensurate with the successful work done by them, and the extraordinary suffering entailed through no fault of their own, I respectfully recommend that their Arctic services may be considered as rendering all these men eligible for appointment to the retired list of the Army, as of the grades of signal sergeants and hospital stewards.

Regarding Lieutenant Greely, the Chief Signal Officer trusts that proper recognition may be taken of his services by renewal and passage of the bill reported favorably at the last session of Congress with a view to his becoming assistant to the Chief Signal Officer. A good war record, wounds, and twenty-four years' honorable service (seventeen in connection with this corps), apart from his remarkable Arctic service, entitles him to this consideration. His present physical condition precludes active cavalry service, and, under present prospects, relieved by law from signal duty, he would go, after a quarter of a century's service, to the retired list, a lieutenant. His loss would be a misfortune to the Signal Corps, with which he has distinguished himself, and to the successful organization and perfection of which he has materially contributed. The experience of the past year emphasizes the importance of a field officer as assistant to the Chief Signal Officer. Under present arrangements any absence of the Chief Signal Officer results in the administration of the bureau by the Disbursing Officer, who necessarily supervises and authorizes his own disbursements. The debt still due both the dead and the living of the International Polar Expedition, led by Lieutenant Greely, which so perfectly performed all its work, it is believed the country is anxious and ready to meet, and it is hoped that no question as to the faults of others, and for which they are not responsible, may prevent so just a purpose. Fitting recognition is due the memory of Lieutenant Lockwood, who so heroically carried the ensign of his country further into the mysteries of the North than any other was ever carried. Promotion to Lieutenant Greely and Sergeant Brainard, whose pathetic stories are now ready for the world, and whose records of efficiency, courage, and generosity are all that highest manhood could make them, should be quick and fitting, while the four remaining survivors should be put upon the list of public servants whose accomplished work entitles them to public support.

Lieutenant Ray, having completed the work for which he was detailed, promptly asked to return to his regiment. An officer of the line, without special training for the delicate duties imposed, Lieutenant Ray executed his trust with great fidelity and efficiency, showing throughout the best qualities of a gentleman and soldier.

APPROPRIATIONS.

The limited appropriation for the support of this service during the last fiscal year left it in a crippled condition, and I have not been able to fully meet the demands for special reports and weather forecasts from the various sections of the country. The service has been maintained and good result secured, but it has been impossible to carry on the full work of this bureau, while a slight increase in the appropriation would have enabled me to more fully disseminate the information collected at this office, thus securing greater benefits to the people.

The number of stations for the display of cautionary signals on the lakes should be increased to meet the demands of those interested in lake navigation, and the necessary funds supplied, which will enable me to keep these stations open at night. The cotton-region reports should be made continuous, but the meagreness of the appropriation for this branch of the service prevented me from commencing this system of report before May 1st.

The appropriation laws of the last three fiscal years were framed under the expressed wish of Congress to separate the appropriation for this

service from those made for the support of the Army. From its organization until recently, the Signal Service has been provided for as a part of the Army. The military duties of the corps are strictly performed, the battalion is organized and under drill, and ready for the performance of its proper duties in time of war.

The meteorological work performed by the Signal Service had its origin and development in the War Department, and, besides being by that right a part of it, it is the most valuable feature of Army work in time of peace, and it is now recommended that while the items of appropriation for the service remain separate and specific, they be made as a part of the appropriation for the Army.

Referring to the appropriations for the fiscal year ending June 30, 1886, I desire to call especial attention to the fact that the estimates submitted have been prepared with great care, and cover only the absolute needs of this service which experience has demonstrated should be provided for, if it is the intention of Congress to maintain the work of this bureau on an efficient basis. If such is not the intention, then the appropriation of anything is wasteful. The people demand an equivalent return for their money, and by inadequate and ambiguous appropriation laws, resulting in a crippled condition, the Signal Service has been unable to satisfy the wants of the agricultural, commercial, and general interests of the country. No other bureau or department of the Government is so hampered by provisos as is this, and as the various branches of work of the service are inseparably connected one with the other, and all contingent upon ample appropriations, it follows, that, while in some items the amounts asked have been given, yet the omission to appropriate in some other item has resulted in the failure of both, as one could not be utilized without the assistance of the other.

The appropriation for fuel is not sufficient for our stations, many of which, in the extreme northwest country, require fires nearly the entire year, and in those latitudes the cost of fuel is proportionately high; the officers of the corps, and those doing duty therewith, have been allowed (as are all officers of the Army), by paragraph 1851, Army Regulations, to purchase fuel at a fixed rate, the Government paying the difference, but by the insufficiency of the appropriation for the fiscal year 1885 this privilege has been denied to them for a portion of the time, and by the failure to insert the necessary proviso in the appropriation acts for 1886 they have been entirely deprived of this legal privilege, thus enacting an unjust discrimination against the officers of this corps and those doing duty therewith.

The estimate for maps and bulletins should be favorably considered, and the amount asked be appropriated, for it is this appropriation which furnishes the means by which the investigations of this service are presented to the public, and a cutting off of any portion of the amount estimated for will entail not only embarrassment but oftentimes complete failure in the dissemination of such information as the public demands from this service.

The total amount of the deficiencies for the fiscal year ending June 30, 1886, is \$396,167, of which \$300,000 are for the purchase of a site and the erection thereon of a fire-proof building for offices suitable for the uses of the Signal Service, and it is especially urged that this particular item may receive favorable consideration, as well, of course, as all others.

It is also respectfully suggested that the Secretary of War recommend the addition of the following clause, viz: "And except such

sums (not to exceed \$3,000) and except such services as the Secretary of War may, in his judgment, deem necessary for the best interests of all concerned," to the proviso in the Army bill which prohibits the use of any money appropriated for other parts of the Army by or for the Signal Corps.

Statement of amounts appropriated for the support of the Signal Service, U. S. Army, for the fiscal year ending June 30, 1885.

Legislative, executive, and judicial:

Regular clerks, messengers, &c.....	\$10,660 00
Scientific experts, clerks, &c.....	45,000 00
Postage stamps, postal union countries, allotted by Secretary of War.....	1,080 00
Stationery allotted by Secretary of War.....	3,583 34
Rent of buildings for Signal Office.....	7,000 00
Contingent expenses allotted by the Secretary of War.....	7,017 49
Total	74,340 83

Sundry civil expenses:

Observation and report of storms—

Manufacture, purchase, and repair of instruments.....	\$5,500 00
Telegraphing reports.....	136,000 00
Expenses storm signals.....	10,000 00
Cotton-belt reports.....	7,000 00
Connection life-saving stations.....	5,500 00
Instrument shelters.....	2,000 00
Rents, &c., of offices outside of Washington.....	40,000 00
River and flood reports.....	10,000 00
Maps and bulletins.....	25,000 00

Total 241,000 00

Maintenance and repair of military telegraph lines.....	\$24,000 00
Stations on Nantucket Island.....	40,000 00

Pay, &c., of the Signal Corps:

Pay of officers.....	\$30,500 00
Pay of enlisted men.....	200,000 00
Mileage to officers.....	5,000 00
Pay of contract surgeons.....	1,200 00
Commutation of quarters to officers.....	8,208 00
Cost of telegrams.....	250 00

Total 245,158 00

Subsistence Department:

Subsistence and commutation of rations, Signal Corps.....	\$155,000 00
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Total 155,000 00

Quartermaster's Department:

Regular supplies—

Fuel.....	\$6,200 00
Commutation of fuel, at \$9.00 per month.....	23,760 00
Commutation of fuel, at \$8.00 per month.....	23,328 00
Forage for mules and horses.....	3,100 00
Stationery.....	100 00
Stoves, and repairs to heating apparatus.....	600 00
Lights.....	300 00
Straw for animals.....	217 00
Straw for bedding.....	46 08

Total 57,651 08

Sundry civil expenses—Continued.

Incidental expenses—

Horse and mule shoes.....	\$500 00
Blacksmith's and other tools.....	400 00
Veterinary supplies.....	300 00
Fire apparatus, disinfectants, &c.....	200 00
Office furniture, Fort Myer.....	100 00

Total 1,500 00

Interment of officers and men.....	\$200 00
Apprehension of deserters.....	120 00

Transportation—

Materials and funds.....	\$25,000 00
Officers and men.....	8,875 00
Means of, mules.....	1,000 00
Means of, harness.....	130 00
Means of, repairs to.....	500 00

Total 35,505 00

Barracks and quarters—

Commutation of quarters.....	\$84,108 00
Work and supplies at Fort Myer.....	1,500 00
Work and supplies on hospital.....	300 00

Total 85,908 00

Clothing, camp, and garrison equipage—

Six wall tents, &c.....	\$415 00
Issues in kind.....	4,960 00

Total 5,315 00

Medical Department:

Medical attendance and medicines, officers and men, Signal Corps.....	\$5,000 00
Medical attendance and medicines, officers with Signal Corps..	100 00
Medical and hospital supplies, Fort Myer.....	700 00
Medicines from depots, &c.....	1,000 00
Material, repairs to hospital, Fort Myer.....	200 00

Total 7,000 00

Printing and binding allotted by the Secretary of War, about..... \$40,000 00

Support of the Army:

Expenses Signal Service, U. S. Army.....	\$5,000 00
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Grand total..... 1,017,698 71

Many private persons, institutions of learning, etc., purchase their instruments through this office, because of the advantage afforded to obtain greater accuracy, by having the instruments compared with our standards, for which no extra charge is made. Of these there have been purchased two hundred and ninety-three instruments at a total cost of \$1,775.30.

PROPERTY AND DISBURSEMENTS.

The improved methods of administering the duties of the Property and Disbursing Division of this office have continued, with gratifying results, and the accounts passed the scrutiny of the accounting officer of the Treasury with few suspensions, and these have been for mere technical informality. All vouchers are paid by checks drawn to order, and in no case to bearer; this mode being considered the safest, not

only in transmitting money, but it also furnishes the assurance that the money reaches the person for whom it is intended. All requisitions are carefully scrutinized, before payment, by an officer other than the Property and Disbursing Officer. The methods of verifying and settling accounts in this bureau are those prescribed by Army Regulations, and are identical with those which govern in the Quartermaster's Department of the Army, with the additional check that these accounts pass the scrutiny of the Examining Division of this office before they are submitted to the accounting officer of the Treasury.

The service has been economically managed, and the additional care of the property, which is widely distributed over the country, has greatly increased the work of the division. Under the present rule, each article purchased is taken up on a property report, which is rendered quarterly for transmission to the Third Auditor of the Treasury, so that there is not one article, from the merest trifle to the most expensive instrument that is purchased, but what is carefully reported to the accounting officer of the Treasury.

The experience of the past year furnishes additional reasons for renewing my recommendation for the erection of a fire-proof building for offices suitable for the uses of the Signal Service, as per plans and estimates contained in Senate Executive Document No. 152, 48th Congress, 1st session. The buildings now occupied by this service are insecure and unsafe for the storage of valuable Government property.

The annual report of Capt. S. M. Mills, Fifth Artillery, Property and Disbursing Officer, for the year ending June 30, 1885, will be found in Appendix No. 68, and the report of the Examining Officer for the same period is given in Appendix No. 69.

PUBLICATIONS.

The Monthly Weather Review of the Signal Service has been regularly published during the year, and with improvements and additions it now forms one of the most valuable productions of this Service. Each Review contains a general summary of the meteorological data collected by this office during the month. The introduction gives a brief statement of the weather conditions throughout the country, and the probable effect of the same upon the agricultural products of each section. The monthly means of temperature and rainfall, compared with the normal temperature and average rainfall for each district, are published in tabular form. Similar tables referring specially to the cotton region are given, based upon cotton-region reports. These tables are increasing in value from year to year, as they afford means of comparison between the meteorological conditions and their probable effect upon the crop.

A large number of marine reports are received in time to be utilized in tracing storms from the continent over the north Atlantic, and the probable tracks of these storms are given on the monthly charts accompanying the Review, thus affording information specially valuable to shipmasters.

The Monthly Summary and Review of International Meteorological Observations contains a summary of the reports published in the International Bulletin, and a general discussion of the meteorological conditions prevailing over the northern hemisphere. These observations have been published since 1873, and they furnish a valuable collection of data for the solution of the great problem of meteorology. With a view to economy I have discontinued the publication of the bulletin

and substituted a large daily chart, upon which the data is presented in graphic form.

The annual report of the officer in charge of the Fact and International Bulletin Division, in which these publications are prepared, will be found in Appendix No. 64.

Work has been continued on the publication known as the Meteorological Record, and by special authority of the Secretary of War arrangements have been made for the issue of this important work for a single year.

This publication contains a revised edition of the tri-daily bulletins and charts of this service, and affords a meteorological record of especial value in the study of storm movements within the United States. It is the most complete work now issued, and it is recommended that some provision be made for its regular publication.

The following Professional Papers of the Signal Service have been published during the year:

XIV. Charts of Relative Storm Frequency for a Portion of the Northern Hemisphere.—J. P. Finley, 2d Lieutenant, Signal Corps.

XV. Researches on Solar Heat and its Absorption by the Earth's Atmosphere.—Prof. S. P. Langley.

XVI. Toronado Studies for 1884.—J. P. Finley, 2d Lieutenant, Signal Corps.

The following Signal Service Notes have been published during the year:

XIII. The Relation between Magnetic Storms and Northers at Havana, Cuba.—G. E. Curtis, Sergeant, Signal Corps.

XIV. Physical Observations on Board the Lady Franklin Bay Expedition of 1883.—W. H. Lamar, jr., and F. W. Ellis, Sergeants, Signal Corps.

XV. River Floods and Danger Lines of 1882.—Prof. H. A. Hazen.

XVI. The Effects of Wind Currents on Rainfall.—G. E. Curtis, Sergeant, Signal Corps.

XVII. A First Report upon Observations of Atmospheric Electricity at Baltimore, Maryland.—Park Morrill, Private, Signal Corps.

XVIII. The Aurora in its Relation to Meteorology.—A. McAdie, Private, Signal Corps.

XIX. Report on the Tornado of August 28, 1884, near Huron, Dakota.—S. W. Glenn, Sergeant, Signal Corps.

XX. Report on Thunder-storms of May, 1884.—Prof. H. A. Hazen.

These publications are based upon the data collected by this office, and contain results which bear directly upon the current work of the service. It is therefore recommended that some provision be made for the continued publication of papers of this character.

Appendix No. 70 contains the report of the officer in charge of the Publications Division.

PERSONNEL.

The general work of the service is performed by twenty-one officers, three professors, three junior professors, five hundred enlisted men, and fourteen civilian clerks. Under the provisions of an act of Congress approved July 7, 1884, limiting the number of officers to be detailed from the line of the Army as acting signal officers, Lieutenants Caziarc, Ward, and Maus were relieved by S. O. No. 166, dated July 17, 1884, 2d Lieutenant B. M. Purssell, Signal Corps, U. S. A., was assigned to duty July 19th, relieving Lieutenant Caziarc, as officer in charge of Correspondence and Records Division; his report as officer in charge of

this division will be found in Appendix No. 64. 2d Lieutenant F. M. M. Beall, Signal Corps, U. S. A., was assigned to duty July 19th, relieving Lieutenant F. K. Ward, in charge of Stations Division.

Under the provisions of an act of Congress approved March 3, 1885, limiting the number of officers to be detailed from the line of the Army as acting signal officers, Lieutenant James Allen, an indication officer, was relieved from duty and ordered to his regiment by S. O. No. 142, dated June 23, 1885; Captain S. M. Mills and Lieutenant P. H. Ray were relieved from duty as acting signal officers, at their own request, on June 30th and June 20th, respectively.

Captain F. B. Jones, A. Q. M., was detailed by the Secretary of War as acting signal officer, and relieved Captain S. M. Mills of his duties as Property and Disbursing Officer of the Signal Service, July 1, 1885.

Sergeants James Mitchell and Frank W. Ellis were promoted to be 2d Lieutenants in the Signal Corps, to date August 15, 1885, after having passed a successful competitive examination.

The enlisted men of the service were distributed as follows: one hundred and sixty-two at the office of the Chief Signal Officer (since reduced to one hundred and fifty, and will be still further reduced); on telegraph lines, ninety-seven; at Fort Myer, thirty-three; and at Signal Service stations, two hundred and two, leaving six vacancies.

ORGANIZATION OF THE SIGNAL CORPS.

A completed organization for the Signal Corps is of the greatest importance. By retaining the experience of officers who have served for long periods in this service great economies can be secured each year, serious mistakes can be avoided, and excellence of service can be obtained in no other way.

The entire subject of reorganization of the Signal Corps is now in the hands of a joint commission of Congress that has thoroughly investigated it, and their report may be looked for at the meeting of Congress. This commission, with great patience, gave the fullest opportunity for the presentation of the views of the Chief Signal Officer, and he reasonably expects such recommendations to Congress as will result in permanence and great advantage to the service, in which he hopes for the concurrence and aid of the Honorable Secretary of War. The following extracts from the record of testimony before the commission show the need and kind of organization necessary, and wherein it is now deficient:

A FIXED ORGANIZATION.

The necessity of a fixed organization is the same as in any other military body. Without it the loss of experience by instructed officers leaving the service is a constant source of weakness, and loss in money as well as experience.

The saving of money where well-matured experience is applied in the disbursement of large sums (a million dollars a year in the Signal Service) bears about the same relation to its disbursements, when done by temporary details, as the building of a house with inexperienced mechanics does to building it with thoroughly trained men who know their business.

The saving by the legislation I have recommended, that is, by giving a permanent corps, would many times pay the cost of salaries, and in discipline and organization it is absolutely necessary. Now, when an officer is derelict and discipline becomes necessary, he asks to join his regiment, which is granted, and he is not only lost to my service, but an example of my want of power to enforce discipline is shown to those who remain.

The want of such a corps is felt every day and it is hoped that Congress will no longer withhold its benefits, leaving it alone, of all services in the Army, weakened

and embarrassed by the want of organization. This is one of the ways in which economy and efficiency can be secured by legislation, and the other, as refers to economy, is to build an office for the Signal Service, and the saving in rents will be greater than the value of the money it will cost.

A military organization is required because, to do our work, the military habit is necessary, that is, unquestioned obedience, promptness, and accurate methods of work. We must have this, and the military method is the only means ever devised by which this can be accomplished.

By other methods obedience and promptness are not so certain, and while we might get it in the majority of cases, yet there would be times when the continuity of our work would be destroyed by want of promptness, or disobedience of orders. When exact work is required, depending upon the absolute direction of others, it has been the custom of the world always to employ the military plan, and no other has ever been found so competent.

The Articles of War and Regulations of the Army add both to the vigor and efficiency of the Signal Service, and it is that fact alone which enables us to always be sure of getting prompt reports, enabling us to make our predictions in minutes, where the civil bureaus of Europe take hours, giving our bureau a prominence over all others.

These reasons of time, and the use of delicate instruments, require training and long practice, and especially the absolute dependence on specific time apply in such force to no civil, and no other military, bureau.

The necessity for grades of rank in every military organization has been recognized from time beyond record. It is the prime condition of their wholesome existence. These grades are all there is for the ambition of military men to look ahead to, it corresponds to the regular forward steps men look for in all walks of life; and without increased rank with age, a permanent military organization would have within it the conditions of its own infirmity and inferiority, and no good man would remain in it; at present, there is no promotion provided.

Our meteorological work all depends upon an accurate and continuous record. Without both of these conditions the work is valueless. To get these conditions, observers must be carefully trained, and must be held with an absolute control. This makes a military organization indispensable.

The gathering of these series is traditionally military work, and all that is of much value has been done under some form of military organization. Our own is the first in extent and value, and was begun about 1820, by the Medical Department of the Army. It has been kept up ever since, and fifty-two of the post hospitals still report to us, and give us valuable reports. The next in value is by the English ordnance. Then comes those of the religious orders, the monasteries, and they have what corresponds to a military control of the strictest kind, which has enabled them to secure unbroken series. But our own, by the Signal Service, in the past fifteen years, is unique, and of many times the value of all the other series combined.

There can be no doubt that there will be a loss of efficiency by a transfer. Efficiency is now as high as can be reasonably expected, and any change can but lower it, while to transfer the work will practically destroy the corps, as only its work, and not the men, can be transferred, leaving its future, at best, an experiment of very uncertain success.

The rules governing it are the development of fifteen years, are of a purely military nature, and will not suit a civilian organization. In fact, very much that we have done in the way of organization and plan, which has cost all these years of labor and money, and which has given such eminent satisfaction everywhere, will be lost. The country is satisfied and there is no call for its transfer.

The work is now done much more economically than it could be by a civil organization. It is a well-known fact that, except in the highest grades, military wages the world over are less than any other, and especially less than in the civil public service.

This is due largely, especially in republics, to a fixedness of service and removal from personal and political fluctuations.

We now pay \$65 and \$100 a month, when a like grade of men in civil employment, and who are less educated, receive \$100 and \$150. The latter figures would certainly rule in a civil service.

The chiefs of our offices in large cities are now most efficient, and do the work as sergeants, with the pay of, say, \$1,200 a year. Under civil service rule these places would certainly be magnified to correspond with chiefs of the other public offices by which the Signal Office is surrounded, until the pay would be three or four times as great as now.

The work of the men at Signal Service stations extends through seventeen hours of the twenty-four. This, while in the military service, counts as no extra time, and the men sleep between hours; in the civil service, under the law, it will count for more than two days, resulting finally in the employment of two men to do the work

now done by one. These are the sources of additional cost that can be foreseen, and there is no doubt but finally the cost of doing the same work now done, and which certainly will be continued, will cost double what it now does.

By the CHAIRMAN:

Q. This goes on through the entire year?

A. For three hundred and sixty-five days, Sundays and holidays. I do not know that this has come to the attention of the commission, but it is a very important factor.

There is no doubt but these two legal days, more than sixteen hours, would be, under a civil organization, a legal claim.

LEGISLATION NEEDED BY THE SIGNAL SERVICE.

To be added to the Signal Corps, with rank and pay of officers of like grade of cavalry—

1. One colonel.
2. One lieutenant-colonel.
3. One major and disbursing officer.

4. Eight captains; and the second lieutenants of the Signal Corps, after eight years of service as second lieutenants, may be appointed by the President first lieutenants; and after fourteen years' service as lieutenants, may be appointed by the President captains. And the one hundred and fifty sergeants of the Signal Corps shall be composed of three classes: twenty-five of the first class, who shall have the pay proper of \$50 a month; fifty of the second class, who shall have the pay proper of \$40 a month; and seventy-five of the third class, who shall have the pay proper of \$34 a month, the same as now. And all the sergeants, corporals, and privates of the first class shall be known as "Observers of the Signal Service."

I am, sir, very respectfully, your obedient servant,

W. B. HAZEN,
Brig. and Bvt. Maj. Gen'l,
Chief Signal Officer, U. S. Army.

Hon. WILLIAM C. ENDICOTT,
Secretary of War.

LIST OF APPENDICES ACCOMPANYING THE REPORT OF THE CHIEF SIGNAL OFFICER OF THE ARMY FOR THE YEAR ENDING JUNE 30, 1885.

- 1.—Fort Myer, report of officer in charge.
 - 2.—Rules and regulations of the Indications Room.
 - 3.—Report of the officer in charge of the Pacific Coast Division of the Signal Service.
 - 4.—Summary of the work performed in the Stations Division.
 - 5.—Table showing the mean normal pressure, corrected for temperature and instrumental error only, at stations of the Signal Service, U. S. Army, for each month and the year, with monthly constants for the reduction to sea-level of barometric observations made at Signal Service stations. Compiled from January, 1880, to December, 1884, inclusive, except at stations opened subsequent to the former date. Obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) normals by 3.
 - 6.—Table showing the mean of the highest pressure (reduced to sea-level) at stations of the Signal Service, U. S. Army, for each month of the year. Compiled from the commencement of observations at each station to, and including, December 31, 1881.
 - 7.—Table showing the mean of the lowest pressure (reduced to sea-level) at stations of the Signal Service, U. S. Army, for each month of the year. Compiled from the commencement of observations at each station to, and including, December 31, 1884.
 - 8.—Table of mean temperatures at stations of the Signal Service, U. S. Army, for each month and the year. Computed from the commencement of observations at each, to and including July, 1872. The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.35 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.
 - 9.—Table of mean temperatures at stations of the Signal Service, U. S. Army, for each month and the year. Computed from September, 1872, to, and including, October, 1879, except at stations opened subsequent to the former date. The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11 p. m. (Washington time) observations by 3.
 - 10.—Table of mean temperatures at stations of the Signal Service, U. S. Army, for each month and the year. Computed from November, 1879, to December, 1884, both inclusive, except at stations opened subsequent to the former date. The daily means are those obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) observations by 3.
 - 11.—Table showing the mean monthly temperature and departure of 1884 therefrom in degrees (Fahr.) at selected stations of the Signal Service, U. S. Army. This normal has been computed for the decade ending December 31, 1884. The daily means are obtained by dividing the sum of the three observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.
- NOTE.—Observations from January 1, 1875, to November 1, 1879, taken at 7.35 a. m., 4.35 and 11 p. m. (Washington time), and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time).
- 12.—Table showing the annual and mean annual temperatures at stations of the Signal Service, U. S. Army. The daily means are obtained by dividing the sum of the three telegraphic observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month; the annual, by dividing the sum of the monthly by 12.
- NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time).
- 13.—Table showing the mean daily range of temperature at stations of the Signal Service, U. S. Army, for each month of the year 1884. The daily range is the difference between the highest and lowest temperatures, as recorded on self-registering thermometers; the mean daily is obtained by dividing the sum of the daily by the number of days in the month.

- 14.—Table showing the highest temperature, and year in which it occurred, at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations at each, to, and including, December, 1884, from self-registering thermometers.
 - 15.—Table showing the lowest temperature, and year in which it occurred, at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations to, and including, December, 1884, from self-registering thermometers.
 - 16.—Table showing the monthly and annual mean temperatures from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1884. The daily mean is generally obtained by dividing the sum of the 7 a. m., 2, and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.
 - 17.—Table showing the monthly maximum and minimum temperatures, and annual range of temperature, from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1884, from self-registering thermometers.
 - 18.—Table showing the monthly and annual mean temperatures at military post hospitals for the year ending December 31, 1884. The daily mean is obtained by dividing the sum of the 7 a. m., 2, and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.
 - 19.—Table showing the monthly maximum and minimum temperatures, and annual range of temperature at military post hospitals, for the year ending December 31, 1884, from self-registering thermometers.
 - 20.—Table showing the monthly and annual mean temperatures at stations on the Central Pacific and Southern Pacific Railroads and connecting branches, for the year ending December 31, 1884. The daily mean is obtained by dividing the sum of the maximum and minimum temperatures by 2; the monthly, by dividing the sum of the daily by the number of days in the month.
 - 21.—Table showing the monthly maximum and minimum temperatures at stations on the Central Pacific and Southern Pacific Railroads and connecting branches, for the year ending December 31, 1884, from self-registering thermometers.
 - 22.—Table showing the mean of the maximum and minimum temperatures at the cotton-region stations of the Signal Service, U. S. Army, for the months of July to October, 1884, and May and June, 1885. These means are obtained by dividing the sums of the daily readings of self-registering thermometers by the number of observations taken—one daily at 5 p. m. (central time).
 - 23.—Table showing the mean temperature at 7 a. m., 3 and 11 p. m. (Washington time) at stations of the Signal Service, U. S. Army, for each month of the year. Computed from January 1, 1880, to December 31, 1884.
 - 24.—Table showing the mean a. m., p. m., and midnight temperatures at stations of the Signal Service, U. S. Army, for each month of the year. Computed from the commencement of observations to December 31, 1884.
- NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time).
- 25.—Table showing the average temperature of the surface of the ocean at stations of the Signal Service, U. S. Army, on the Atlantic and Gulf coasts, for each month and the year. Computed from observations taken at 2 p. m. (Washington time), daily, from the date observations began to December 31, 1884.
 - 26.—Table showing the mean temperature and average precipitation, the latter in inches and hundredths, at stations of the Signal Service, U. S. Army, for each season of the year. Computed from the commencement of observations at each to, and including, December, 1884. The mean temperature is deduced from three telegraphic observations taken at the same moment of Washington time at all stations. The seasons comprise the following months: Spring—March, April, and May. Summer—June, July, and August. Autumn—September, October, November. Winter—December, January, and February.
- NOTE.—Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); and from November 1, 1879, to December 31, 1884, at 7 a. m., 3 and 11 p. m. (Washington time).
- 27.—Table showing the normal precipitation and departure (of 1884) therefrom, in inches and hundredths, at stations of the Signal Service, U. S. Army, for each month of the year. The normal has been computed from the commencement of observations to December, 1884, inclusive.
 - 28.—Table showing the average precipitation, in inches and hundredths, at selected stations of the Signal Service, U. S. Army, for each month and the year. Computed for the decade ending December 31, 1884.

- 29.—Table showing the average precipitation, in inches and hundredths, at selected stations of the Signal Service, U. S. Army, for each month and the year. Computed from January, 1880, to, and including, December, 1884.
- 30.—Table showing the annual and mean annual precipitation, in inches and hundredths, at stations of the Signal Service, U. S. Army. Compiled from the commencement of observations to 1884, inclusive.
- 31.—Table showing the monthly and annual precipitation, in inches and hundredths, from reports made by voluntary observers of the Signal Service, U. S. Army, for the year ending December 31, 1884.
- 32.—Table showing the monthly and annual precipitation, in inches and hundredths, at military post hospitals, for the year ending December 31, 1884.
- 33.—Table showing the monthly and annual precipitation, in inches and hundredths, at stations on the Central Pacific and Southern Pacific Railroads and connecting branches for the year ending December 31, 1884. (Copied from the records on file at the office of the chief engineer, C. P. R. R.)
- 34.—Table showing the precipitation, in inches and hundredths, at the cotton-region stations of the Signal Service, U. S. Army, for the months of July to October, 1884, inclusive, and May and June, 1885.
- 35.—Table of mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year. Computed from the commencement of observations at each to, and including, July, 1872. The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.35 p. m. (Washington time) observations by 3.
- 36.—Table of mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year. Computed from September, 1872, to, and including, October, 1879, except at stations opened subsequent to the former date. The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11 p. m. (Washington time) observations by 3.
- 37.—Table of mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year. Computed from November, 1879, to December, 1884, both inclusive, except at stations opened subsequent to the former date. The daily means are obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) observations by 3.
- 38.—Table of mean relative humidity at stations of the Signal Service, U. S. Army, for each month and the year. Computed from the 7 a. m., 3 and 11 p. m. (Washington time) observations, and from January 1, 1882, to December 31, 1884.
- 39.—Table showing the average dew-point at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from January, 1882, to, and including, December, 1884. The daily means are obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) observations by 3.
- 40.—Table showing the date of the first light frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1884-'85.
- 41.—Tables showing the dates of the first killing frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for each winter from 1873-'74 to the winter of 1884-'85, inclusive.
- 42.—Table showing the date of the last light frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1884-'85.
- 43.—Table showing the date of the last killing frost at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for each winter from the commencement of observations to, and including, the winter of 1884-'85.
- 44.—Table showing the date of the first snowfall at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1884-'85.
- 45.—Table showing the date of the last snowfall at stations of the Signal Service, U. S. Army, east of the Rocky Mountains, for the winter of 1884-'85.
- 46.—Table showing the average movement of the wind, in miles, at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations at each to, and including, December, 1884.
- 47.—Table showing the average hourly velocity of the wind, in miles, at stations of the Signal Service, U. S. Army, for each month and the year. Computed from the commencement of observations at each to, and including, December, 1884. The average hourly velocity is obtained by dividing the average monthly movement by the number of days in the month, and the result by 24.
- 48.—Table showing the average cloudiness (scale of 0 to 10) at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations at each to, and including, December, 1884, from the three telegraphic observations. The monthly average is obtained by dividing the sums of the amount of cloudiness recorded daily by the number of observations taken.

- 49.—Table showing the average number of clear, fair, and cloudy days at stations of the Signal Service, U. S. Army, for each month and the year. Compiled from the commencement of observations at each to, and including, December, 1884, from the three telegraphic observations. Cloudiness is recorded on a scale of 0 to 10, each observation. Clear days comprise from 0 to 8 tenths; fair, 9 to 22; and cloudy, 23 to 30.
- 50.—Directions from which the prevailing winds have been observed to blow at stations on the Central Pacific and Southern Pacific Railroads and connecting branches, during each month of the year 1884. (Copied from the records on file at the office of the chief engineer, C. P. R. R.)
- 51.—Directions from which the prevailing winds have been observed to blow at stations of the Signal Service, U. S. Army, during each month of the year. Computed from the commencement of observations at each to, and including, December, 1884.
- 52.—Annual meteorological summaries (Forms 127 B) at stations of the Signal Service, U. S. Army.
- 53.—Description of the various districts shown on the Signal Service district map.
- 54.—Report of the display of cold-wave signals.
- 55.—Report upon the temperature and weather signals.
- 56.—Railway weather bulletin service.
- 57.—River reports and flood warnings.
- 58.—System of cotton-region reports.
- 59.—Classified list of stations of the Signal Service.
- 60.—Report of the display of cautionary signals at special stations.
- 61.—List of stations of the first and second order, established since November 1, 1870, together with the dates on which those not in operation on June 30, 1885, were closed.
- 62.—Signal Service agencies.
- 63.—Report of officer in charge of telegraph lines.
- 64.—Report of officer in charge of Correspondence and Records Division.*
- 65.—Report of officer in charge of Fact and International Bulletin Division.
- 66.—Report of assistant in charge of the Study Room Division.
- 67.—Report of assistant in charge of Physical Laboratory.
- 68.—Report of the Property and Disbursing Officer.
- 69.—Report of officer in charge of Examiner's Division.
- 70.—Report of officer in charge of Publications Division.
- 71.—Meteorological Researches, Prof. William Ferrel.

APPENDIX I.

REPORT OF OFFICER IN CHARGE OF FORT MYER.

FORT MYER, VIRGINIA, July 10, 1885.

GENERAL: I have the honor to submit my annual report of the school of instruction and post of Fort Myer for the fiscal year ending June 30, 1885.

The course of instruction as prescribed for officers and enlisted men has been closely followed.

Five officers of the Signal Corps reported during the year for instruction, namely, Lieut. Frank Greene, J. H. Weber, J. P. Finley, J. E. Maxfield, and F. R. Day. Lieutenant Weber was relieved from duty November 8, 1884, without completing his course, and granted sick leave. The remaining four officers completed the full course and passed the final examination.

Lieutenants Walshe, Finley, and Day were ordered on inspection duty February 27, 1885, and returned to duty at this post on the following dates: Lieutenant Finley, May 20, Lieutenant Day, May 31, and Lieutenant Walshe, June 2.

Lieutenant Day was relieved from duty at this post June 1, 1885, and ordered to report at the office of the Chief Signal Officer.

At the commencement of the fiscal year, July 1, 1884, there were 13 enlisted men under instruction; of this number, 2 (privates Flynn and Frazee) were discharged for misconduct, 1 (Private Hill) deserted, and 1 (Private Brown) failed on final examination and was discharged. The remainder completed the full course and passed.

Thirty-nine enlisted men reported for instruction during the year; of this number 31 completed the full prescribed course and passed, 2 (Privates Davis and Sues) failed on final examination, 5 (Privates Laughlin, Wyman, Welch, Hoffman, and Chapman) were discharged before completion of course on account of incompetency, and 1 (Private Keenan) died of consumption.

Lieutenants Greene, Walshe, and Maxfield have assisted in the instruction department during the year. The prescribed course of lectures for enlisted men were delivered by Lieutenant Maxfield.

Instruction in military signaling by flag and torch, heliograph, homographic and international code, and in electricity and practical telegraphy, was given during the year to officers and enlisted men. A ten days' course in Mendall's military surveying was given to the class of officers, which consisted of rough sketches taken in the field.

Owing to the want of horses for the proper equipment of the field telegraph train, all drills and instruction in the use of this important feature of the corps in time of war could not be carried on. It is hoped that the time is not far distant when this matter will receive from Congress the consideration it deserves, that the necessary means may be provided which will enable the Chief Signal Officer to keep pace with other countries in this method of communicating with the different commanders of the army while in battle.

POST ADMINISTRATION.

Improvements of the post have been carried on during the year as mapped out by the Chief Signal Officer, and the results have been highly satisfactory, the most important being the grading and graveling of the road from the cemetery to the Aqueduct bridge, guttering with cobble-stone, trimming out and grubbing along the roadsides. A gravel walk has been put down leading to the laundress' quarters, a new road opened in rear of the quartermaster's storehouse, and the grounds on the north and west of this building have been graded, top dressed, and ready for grass seed in the fall.

The saw-mill, an unsightly building, standing near the west end of the quartermaster's storehouse, has been moved to a more suitable place. A great amount of grubbing and cleaning up has been done during the year in the field inclosed with the wire fence. The woods lying south of the post, and extending to the cemetery wall, is now being cleared up by grubbing, leaving a clear view of the city and Arlington Heights.

Water-closets, with ample sewerage, have been constructed at the hospital, instruction building, and laundress' quarters, and adds greatly to the sanitary condition of the post. The old privies, with wood troughs, heretofore in use, have been torn down. A good system of surface drainage has been put down for draining the cellars of the officers' quarters and the stables and corral yard.

REPORT OF THE CHIEF SIGNAL OFFICER.

As the improvements inaugurated by the Chief Signal Officer have progressed the numerous mud-holes heretofore visible have been entirely obliterated. A thorough police of the post has been rigidly maintained, and its sanitary condition is good. Orders of the Chief Signal Officer require a weekly inspection of the post by the medical officer, with a view of ascertaining its sanitary condition, and all recommendations of this officer are promptly carried out.

The old and defective water-closets in the officers' quarters have been replaced by the Demorest patent with flushing tanks. This insures an ample supply of water, and thoroughly flushes the closets and soil pipes. This was impossible while the old style of closets was kept in use in these buildings. The bad odors and gases heretofore so noticeable have now been obviated.

The full quota of men for the permanent party has been obtained and comprises a good steady working force. The non-commissioned officers have well performed all duties assigned them. It is hoped steps may be taken to insure extra-duty pay for the mechanics and laborers of this force, which they so much need and deserve.

I am, general, very respectfully, your obedient servant,

JAMES A. SWIFT,

Second Lieutenant Signal Corps, U. S. Army, in charge.

To the CHIEF SIGNAL OFFICER, U. S. A.,
Washington, D. C.

APPENDIX 2.

RULES AND REGULATIONS OF THE INDICATIONS ROOM.

INSTRUCTIONS }
No. 22. }SIGNAL OFFICE, WAR DEPARTMENT,
Washington, April 22, 1885.

I. Paragraphs 100 to 222b, inclusive, Office Regulations, 1883, are annulled.

II. The following compendium of rules and regulations relating to the indications division is published for the information and guidance of those concerned.

1. The indications officer will have charge of the division for the preparation of synopses and indications, which will be designated as the indications division; he will carefully scrutinize the charts and latest reports, and call the especial attention of the indications board to all meteorological conditions requiring attention under the regulations; and will at all times keep himself informed of all regulations referring to indications.

A.—For the guidance of the officer in charge.

2. He will be at the office at 9 a. m., 12 m., 5 p. m., and 12 midnight each day.

3. He will examine the reports carefully to discover telegraphic errors; note all such errors and call upon the telegraph division for corrections when they are necessary and can be obtained.

4. He is strictly required to draw his own isobars and isotherms upon the weather chart (No. 1) used in preparing the synopsis and indications.

5. He will verify or correct the manifold copy of the synopsis and indications, seeing that the text is clear and legible, and will attach his name to it. He will also see, so far as it may be in his power, that they are given the widest publication where they are useful. He will take such efficient steps as will insure the speediest delivery of the indications, bulletins, and charts to the press and post-office, and his responsibility and duties will only end when this is done. (Ins. 69, 1884.)

6. A single copy of the synopsis for the a. m. report will be sent to the publications division by 9.26 a. m., the complete synopsis and indications not later than 9.49 a. m., the morning special bulletin at 9.52 a. m., and the indications for the midnight report at 12.45 a. m. (Ins. 140, 1884.)

7. He will call for special telegraphic observations to be taken at such stations, and at such times as he may consider necessary. When river reports are to be discontinued he will notify the officer in charge of the stations division, who will issue the necessary orders. (Ins. 74, 1884.)

8. For the morning weather chart he will make tracings of the isobars, isotherms, and storm-tracks from the original charts of the 7 a. m. report as soon as practicable, preferably before the completion of the indications. These tracings will be sent to the lithographing room by or before 9.26 a. m., daily. He will give close attention to the morning weather chart until it has been actually completed, seeing that all through its several stages the work is correctly done and leaving no chance for errors. For this purpose he will visit the printing room, and inspect the chart when it is first struck off, and verify it before allowing the edition to be printed. (Ins. 140, 1884.)

9. He will compare each tri-daily indications of the previous day with the conditions exhibited in the three succeeding weather charts.

10. He will particularly notice, in connection with the study of charts, the rain and dry-wind charts, the charts and tables of normal temperatures and normal barometric pressures and the barometric oscillations for the several stations, the charts exhibiting average direction of translation of low barometers (storm-tracks), the Monthly Weather Review and its charts, and the file of tri-daily charts and prevailing wind-directions. These charts should be examined in reference to the corresponding month of preceding years, and to the months preceding and succeeding. Particular attention should be given to the study of the cloud areas and of dew-points as affecting probable changes of night temperature.

11. On the day of assignment to duty in charge of the indications division he will carefully examine all instructions pertaining to that division.

12. He will see that the mounted messenger is present, with horse saddled, at the moment the indications are ready, and that he starts immediately at a rapid pace; and failing in this, in any particular, he will report the fact in writing. (G. O. 28, 1873; Ins. 29, 1876.)

13. A messenger will report to him each morning at 9 o'clock in the indications room, and continue under his orders until after the completion of the morning duties. (Ins. 192, 1881.)

14. As without sleep in the daytime, the fatigue caused by this duty is too great to permit its best discharge, officers on that duty are recommended to sleep in the afternoon. (Cir. 5, 1874.)

15. Officers on duty in the indications division are excused, during the time of their tour, from the continuous night-watch, as noted in paragraph 3, page 80, General Regulations, 1885, but may be required to remain at the office to announce the progress of storms or other facts connected with their especial duty when such announcements are needed. (Ins. 14, 1878.)

16. Before taking charge of indications division, the officer assigned will report to the Chief Signal Officer for instructions. (Ins. 13, 1884.)

17. Form 434 (check-slip for indications officer) will be carefully examined by the indications officer at each report, and as each item of the report is completed it will be successively checked. The check-slips will be sent with the record book of the indications board to the Chief Signal Officer before 12 m. daily, except Sunday. (Ins. 69, 1884.)

18. Action upon telegrams requesting special weather indications will be taken at once by the officer in charge of the indications division. (Ins. 111, 1884.)

PRESS REPORTS.

19. In preparing press reports (Form 109a) when the indications are completed for any district, its name in the margin of the report will be checked with a cross (thus +). When the indications are intentionally omitted for any district its name will be checked with a zero (thus 0).

20. For the press dispatch, the officer in charge will endeavor to get out the morning synopsis and indications at 9.49 a. m.; the special bulletin at 9.52 a. m., and the midnight indications at 12.45 a. m. (Ins. 140, 1884.)

21. One file of the manifold press reports will be kept in the division.

22. The list of addresses for the distribution of the press reports and special bulletins will be posted in the indications division and kept corrected to date. (L. R. 6679, Mia., 1884.)

CHARTS.

23. The following designation is adopted for indications-division charts, and will be written in blue pencil on the right-hand lower corner of each leaf, in each monthly book of tri-daily charts together with the name of the officer in charge of indications, and the date and number of the tri-daily chart. The 7 a. m., 3 p. m., and 11 p. m. charts being numbered "i," "ii," and "iii," respectively: Chart 1, weather; Chart 2, barometric changes; Chart 3, barometric departures and abnormal variations; Chart 4, temperature changes; Chart 5, temperature departures and abnormal variations; Chart 6, clouds; Chart 7, dew-points. (Ins. 53, 1881.)

24. In the preparation of these charts, pencils of different colors, as prescribed, will be used. When not otherwise stated, the ordinary black lead pencil is intended. If possible, all lines traced on these charts will be extended across the continent.

25. Charts 1 to 6, inclusive, for May 1, 1881, and Chart 7, for July 1, 1881, will be followed as models. No change will be made in any of these charts without the written authority of the Chief Signal Officer. (Ins. 53, 1881.)

26. Each officer in turning over the charge of the indications division to his successor will see that the charts are completed to the date of relief. (Ins. 40, 1877.)

27. All telegraphic reports received by mail on account of being delayed at stations or at transfer offices, from any cause, will, as soon as they arrive, be translated and entered on the indications charts. (Ins. 16, 1884.)

28. On all charts, data received too late for use in current indications will be entered in blue; in such instances, the amount of precipitation, if any, will be underscored in red.

29. Chart corrections to reports will be given in blue by the side of the corresponding erroneous data, through which a blue line will be traced.

CHART No. 1.

30. Chart 1 will show for each station: (1) temperature; (2) barometer (reduced to sea-level); (3) wind velocity, and when reported, the maximum velocity since last regular report; (4) amount of rainfall (or melted snow); (5) state of weather; (6) wind direction; (7) ocean swell at certain sea-coast stations.

31. Isotherms, with their proper figures, will be drawn in blue for each ten degrees of temperature, in full lines; when doubtful, in broken lines.

32. Isobars, with their figures, will be drawn in red for each tenth of an inch of atmospheric pressure, in full lines; when doubtful, in broken lines. The words "high" or "low" will be so placed as to show the relative barometric condition of the regions marked.

33. The wind velocity will be entered as received, in miles per hour if registered; if estimated, by writing "calm," "light," "high," &c., as the case may be. Maximum wind velocities, when reported, will be entered in parenthesis to the right of the current velocity.

34. The amount of precipitation for the eight hours preceding the report, if any, will be entered in inches, tenths, and hundredths, underscored in blue; if inappreciable, a short horizontal line will be drawn, underscored by a similar line in blue. The absence of precipitation will be shown by the figures 00.

35. The direction of the wind will be shown by an arrow, flying with the wind, drawn through the center of the station circle.

36. The state of the weather at the time of the report will be shown thus: Cloudy or fair by circles fully or one-half shaded; heavy rain by "R."; light rain by "r."; heavy show by "S."; light snow by "s."; threatening by "T."; clearing by "C."; foggy by "f."; hazy by "z."; smoky by "sm."; sleeting by "slt."; written within the circle. A thunder-storm will be indicated by a short horizontal line in red, within and at the bottom of the circle. Frost will be written in full near the circle and will be underscored in red, prefixed by "K." or "L." to denote killing or light, respectively.

37. The ocean swell from sea-coast stations will show the direction from which it comes and its character as heavy or light, thus: Heavy northeast swell by writing by the side of the station, "Hy. NE." or light south, thus: "Lt. S."

38. The appropriate data from river and other stations not reporting tri-daily will be entered, and on the margin of the 3 p. m. chart the 11 a. m. reports from stations specially called for, noting also the hour of observation.

39. The absence of data for temperature, barometer, wind velocity, weather, and sea swell will be shown by a short horizontal line in the space specified for the data itself.

40. The absence of data for precipitation will be shown by writing in its place "blk." Such absences will also be noted on the margin of the chart.

41. Data of doubtful accuracy will be questioned thus "?", and by a note on the margin of the chart; marginal notes will always be in blue.

42. When a station is reported as missing, the fact will be indicated by drawing a short blue line within the circle.

CHART No. 2.

43. Chart 2, barometric changes, requires the following definitions of the terms used:

An actual barometer is the barometer reading corrected for temperature and instrumental error only.

A reduced barometer is the barometer reading corrected for temperature, instrumental error, and gravity, and reduced to sea-level.

A normal barometer is the mean of actual barometers.

A barometric departure is the difference between the mean barometer for the month and hour of the report and the barometer for a given report.

Abnormal variations in barometer are changes different from the mean hourly changes.

44. On Chart 2 enter within the circle the reduced barometer from regular stations throughout the United States and the actual barometer from Canadian stations for current report; above the barometer and within the circle enter the difference between the current barometer and that of the previous report, prefixed by the sign + if the current reading be higher, and the sign -, if lower. In a similar manner enter the difference between the current barometer and that of the previous twenty-four hours, with proper sign prefixed, within the circle and below the current barometer.

45. Lines in blue will show each tenth of an inch of change in barometer during the past eight hours, with the amount of change in figures, with the sign + to show a rise, and the sign - to show a fall.

46. In a similar way lines in red will be drawn to show each tenth of an inch of change in pressure in twenty-four hours, with corresponding signs and figures.

47. There will also be drawn in blue and red, of double weight, lines to show no change in barometer for eight and for twenty-four hours, respectively, with the sign + and -, each on its appropriate side.

48. A list of corrections will be prepared to be applied to the barometer reports of the first day of each month, so as to exhibit the true changes in actual barometer; these corrections, with proper algebraic signs prefixed, will be written without the circle, and will be applied to the eight and twenty-four hour changes of first report and to the twenty-four hour changes of second and third reports.

CHART No. 3.

49. In connection with Chart 3, barometric departures and abnormal variations, are prepared three auxiliary charts, to show for each station the mean barometer for each tri-daily telegraphic report of the current month; this mean barometer is obtained by adding to the normal barometer for the month and hour of report the monthly constant. The frequency of the wind-direction for the month (including calms) at the several stations, will be shown on these auxiliary charts by arrows flying with the wind, not more than three directions being given. The order of relative frequency will be shown by blue, red, and yellow arrows, respectively. The prevalence of calms will be indicated by drawing a circumference around the circle of station of the proper color, to show the order of relative frequency; also on these auxiliary charts isobars will be drawn in red to show each tenth of inch of mean reduced pressure as determined for each of the tri-daily reports of the month. At the end of the month these charts will be pasted in the back of the book.

50. On Chart 3 enter within the circle for each station the current departure, which is the difference between the current barometer and the mean barometer for the month and hour of report, as entered on the auxiliary charts above referred to. This departure is affected by the sign + if the current barometer be higher than the mean barometer, and with the sign - if it be lower.

51. Compare each departure with the departure of the same station for preceding report, place the difference without the circle, and, if practicable, immediately to the right. This difference, which is the abnormal barometric variation, has the sign + if the current departure is algebraically greater than the preceding, and the sign - if less.

52. Lines in carbon will be drawn to show each tenth of an inch of departure, the amount of such departure in figures, with proper sign prefixed.

53. A carbon line of double weight will show the mean pressure, i. e., be drawn between the + and - departures, with the signs + and -, each on its appropriate side.

54. Lines in blue will be drawn to show each tenth of an inch of abnormal variation in barometer during past eight hours, with amount of change in figures, with the sign + to denote an abnormal increase, and the sign - to denote an abnormal decrease of pressure.

55. A line in blue, of double weight, will show where the variation is normal, i. e., be drawn between the + and - variations, with the signs + and -, each on its appropriate side.

56. On this chart will also be entered the direction of the wind as explained for Chart 1.

CHART No. 4.

57. Chart 4, temperature changes, requires the following definitions:

Actual temperature is the temperature observed, corrected for instrumental error only.

A normal temperature is the mean of actual temperatures.

A temperature departure is the difference between the normal temperature and the actual temperature for a given report.

Abnormal variations in temperature are changes different from the mean hourly changes.

58. On Chart 4, enter within the circle the actual temperature of the current report; above the actual temperature, and within the circle, enter the difference between the current actual temperature and that of the previous report, prefixed by the sign + if the current reading be higher, and the sign - if lower. In a similar manner the difference between the current temperature and that of the report twenty-four hours previous will be entered, with the proper sign prefixed, within the circle and below the actual temperature.

59. Lines in blue will be drawn to show each ten degrees change in temperature during the past eight hours, with the amount of changes in figures, with the sign + to denote a rise, and the sign - a fall.

60. Similar lines in red will be drawn to show each ten degrees of change in temperature during the past twenty-four hours, with figures and signs.

61. There will also be drawn, in blue and red, respectively, lines of double weight to show lines of no change in temperature for eight and twenty-four hours, with the signs + and -, each on its appropriate side.

CHART No. 5.

62. In connection with Chart 5, temperature departures and abnormal variations, three auxiliary charts are used, which show for each station the normal temperature for each tri-daily telegraphic report for the current month. Isotherms will be drawn

on these charts in blue, to show each ten degrees of normal temperature. At the end of the month, these charts will be pasted in the back of the book.

63. On Chart 5 enter within the circle for each station the current departure, i. e., the difference between the current actual temperature and the normal temperature for the month and hour of report, as shown on the auxiliary charts.

64. This departure is prefixed by the sign + if the current actual temperature be higher than the normal, and with the sign —, if lower.

65. Compare each departure with the departure of the same station for the preceding report, place the difference without the circle, and, if practicable, immediately to the right.

66. This difference, which is the abnormal variation in temperature, has the sign + when the current departure is algebraically greater than the preceding, and the sign — when less.

67. Lines in carbon will be traced to show each ten degrees of departure, with the value in figures, and the proper sign prefixed.

68. A carbon line of double weight will show the normal temperatures, i. e., be drawn between the + and — departures, with the signs + and — each on its appropriate side.

69. In a similar manner, lines in blue will be drawn, to show each five degrees of abnormal variation of temperature during the past eight hours, with figures, and the sign + to show an abnormal rise, or the sign — to show an abnormal fall in temperature.

70. A blue line of double weight will be drawn through points of no variation, with the signs + and — each on its appropriate side.

CHART No. 6.

71. On Chart 6 show by the Signal Service cloud symbols the cloud conditions prevailing over the country: For the upper clouds, red, placed above the circle; for the lower clouds, blue, placed below the circle.

72. The area of complete cloudiness will be inclosed by a green line and marked 4.

73. The direction of movement of the clouds will be shown by an arrow of the color used for the clouds.

74. The stations at which precipitation has fallen since the previous report, and is not falling at the time of report, will be marked within, or near the circle, by a blue cross, thus X. The cross will be omitted from stations from which clouds are not required to be sent.

75. Dense haze or smoke will be shown, respectively, by writing within or near the circle "Z" or "SM," and light haze or smoke by "z" or "sm," in red or blue, as the conditions belong to upper or lower clouds.

76. Dense fog will be shown by writing, in blue, "F," within or near the circle, and light fog by "f."

77. On the 7 a. m. chart, will be entered within the circle, the minimum temperature.

78. Isotherms in blue will be drawn, for each ten degrees of minimum temperature, as explained in Chart 1.

79. Temperatures will be compared with temperatures of the same stations for the preceding day, and the difference, prefixed by the signs + or —, to show respectively a rise or fall, will be placed immediately without the circle, and, if practicable, to the right.

80. A line of double weight in red will be traced between the + and — differences to indicate no change in minimum temperature in one day, with the signs + and —, each on its appropriate side.

81. From May 1 to September 30, on the 3 p. m. chart, will be entered within the circle, the maximum temperature. Isotherms in blue will show each ten degrees of maximum temperature. These temperatures will be compared with those of the same stations for the preceding day, and the difference, and sign, will be placed as required in the case of minimum temperatures.

82. A line of double weight, with proper signs in red, will show no change in maximum temperatures in twenty-four hours.

83. On the 11 p. m. chart, the character of the sunset will be shown by Signal Service symbols, i. e., by a vertical tangent, equal in length to the diameter of the circle, and drawn on the west side, in different colors, as follows, viz: Fair, by red; foul, by blue; green, by green; yellow, by yellow. Doubtful sunsets will be shown by an interrogation mark in blue on the west side of the circle.

84. When auroras or halos are reported from stations they will be shown on this chart by a circle drawn within the station circle, auroras in red, halos in blue.

85. Chart No. 7 will show within the circle the temperature of the dew-point—thus, 63; without the circle, and if practicable, immediately to the right, the temperature of the air and the depression of the dew-point below the temperature of the

air—thus, Off. The temperature of the air will be omitted from stations from which the dew-point is not required to be sent.

86. Lines in red, with proper figures, will show each 5° of equal depression of the dew-point. A line in blue will show the dew-point line of 32°.

B.—Duties of clerks.

87. The clerical force of this division will be divided into three reliefs. The first relief from 8 a. m. until 11.30 a. m. The second relief from 3.30 p. m., until relieved by the officer in charge. The third relief from 11.30 p. m., until relieved by the officer in charge.

88. The sergeant, or other enlisted man, in charge of the stations division relief on duty will, during the translation, in the absence of a commissioned officer, be responsible for the discipline in the indications room, and his orders will be promptly obeyed by all men in the room.

89. The clerks will be designated as 1, 2, 3, 4, 5, and 6, with division of duty, in regular detail, as follows:

	A. M.	P. M.	Midnight.
Clerk 1.....	Chart 1.....	Charts 6 and 7.....	
Clerk 2.....		Chart 1.....	Charts 6 and 7.
Clerk 3.....	Charts 6 and 7.....		Chart 1.
Clerk 4.....	Charts 2 and 3.....	Charts 2 and 3.....	
Clerk 5.....		Charts 4 and 5.....	Charts 4 and 5.
Clerk 6.....	Charts 4 and 5.....		Charts 2 and 3.

90. On the 5th day of each month, at the 3 p. m. report, each clerk will assume the duties of the next succeeding number as indicated above, except that 6 will be assigned to the duties of 1.

91. The clerk charged with the preparation of Chart 1 of each report will write the synopsis and indications, prepare all signal orders and special telegrams, and adjust the cautionary-signal board from the signal orders as these orders are read by the assistant in charge. (Ins. 49, 1877.)

92. Each clerk will write his initials in the lower right-hand corner of the chart prepared by him, and he will be held responsible for the correctness and completion of such chart. In case of delay in the receipt of data, he will complete the lines at the first opportunity after the receipt of such data. The clerk entering late data will at the same time enter the eight and twenty-four hour changes. (L. R. 6679, Mis., 1884.)

C.—Preparation of synopsis, indications, special bulletin, &c.

THE SYNOPSIS.

93. The following statements, briefly made, are essential to the "synopsis:"

The regions of highest and lowest barometer, and, if within the limits of the chart, the location and path of the storm-center; in special cases, the direction of movement of high barometers; for the several meteorological districts—the weather, the temperature, and the wind-direction; special temperatures whenever 15°, or more, above or below the normal; heavy rainfalls in past twenty-four hours at selected stations; and the rise and fall of rivers. (G. O. 28, 1873; Ins. 3, 1881; Ins. 69, 1884.)

THE INDICATIONS.

94. The following statements, briefly made, are essential to the "indications:"

For the ensuing twenty-four hours, from the time of observation, in the several geographical districts, the expected condition of weather, wind, temperature, and barometer; anticipated frosts and freezing weather as far in advance as possible; changes anticipated in the rise and fall of rivers; and, at the end, the stations, or when the display is general, the regions, where storm-signals are displayed. (G. O. 28, 1873; Ins. 13, 1877; Ins. 46, 1881; Ins. 69 and 131, 1884.)

95. New forms of expression are forbidden until approved by the Chief Signal Officer.

96. When practicable, use the word veering when the wind changes direction with the hands of a watch, and backing when it changes contrariwise.

97. When practicable, follow the geographical districts in the order shown on Form 109a; and when the weather reports justify such minuteness, name individual States, Territories, lakes, &c.

98. The use of the words *or*, *mostly*, *probably*, *possibly*, and *pressure* is prohibited in all predictions. (Mem., Dec. 13, 1883.)

99. Districts will not be grouped together, but predictions will be made for each district separately, except when the same prediction can be applied to two or more districts. (Mem., Dec. 13, 1883.)

100. Indications of changes in the barometer will be made only when marked or decided changes are likely to occur.

101. Predictions will be made for the following districts, States, and localities: At 7 a. m., 3 p. m., and 11 p. m., for New England, the Middle Atlantic States, the South Atlantic States, the East Gulf States, the West Gulf States, the Ohio Valley and Tennessee, the lower lake region, the upper lake region, the Upper Mississippi Valley, and the Missouri Valley; at 11 p. m., for Colorado, Kansas, and Indian Territory, New England (special), Pennsylvania and Maryland, Northern Alabama, Ohio, the vicinity of New York and Philadelphia, the vicinity of Baltimore and Washington, the vicinity of Albany, and Southern Virginia; at 7 a. m., for New England (special), and for Omaha and vicinity; and such other special predictions as may be ordered from time to time by the Chief Signal Officer. The tri-daily indications for the above-named districts and the 11 p. m. indications for Colorado and the vicinity of New York and Philadelphia will be written on Form 109a, all the others on Form 201. The indications for Pennsylvania and Maryland will be sent by messenger to the Baltimore and Potomac depot, and the 7 a. m. indications for New England (special) to W. E. Barrett, 511 Fourteenth street. The other, Form 201, will be filed in the telegraph room. The 11 p. m. and 7 a. m. indications for New England (special) will be for the ensuing twenty-four and forty-eight hours, and those for 11 p. m. will be sent to the observers at Boston, Mass., and New Haven, Conn. The indications for Albany and vicinity will be sent, "charges collect," to James H. Manning, "The Argus," Albany, N. Y. The indications for Ohio, Northern Alabama, and Pennsylvania and Maryland will be sent as railway weather signals, as provided for in paragraphs 152-5. The indications for Omaha and vicinity will be sent to the observer at Omaha. The indications for the vicinity of Baltimore and Washington will be sent, "charges collect," to the Baltimore Sun, and also to the Washington papers. The indications for Southern Virginia will be sent to the Editor, Dispatch, Richmond, Va.

102. Such parts of the synopsis, indications, and special bulletin as may be of special interest will be marked in red pencil or other distinguishing color. (Mem. 128, 1884.)

103. The following examples are given as models:

WASHINGTON CITY, *Monday*, — — — —, 1 a. m.

SYNOPSIS FOR THE PAST TWENTY-FOUR HOURS.

The storm which was central yesterday morning in Northern Michigan has moved in a southeasterly direction, and is now central over Lake Erie. The barometer is highest in the South Atlantic States and lowest in the lower lake region. The temperature has risen from 3° to 10° in the lower lake region and New England; it has fallen from 13° to 18° in the Missouri Valley; and is from 20° to 30° above the normal in the Ohio and Upper Mississippi Valleys. Heavy rains have fallen at — (stations). Fair weather and southwesterly winds prevail in all districts east of the Mississippi, except in the upper lake region, where the winds are westerly. The winds in the Missouri Valley have shifted to northerly.

The Mississippi has risen 18 inches at Cairo, and the Cumberland 22 inches at Nashville; the Ohio has fallen 19 inches at Cincinnati, the Tennessee 15 inches at Chattanooga, and the Savannah 11 inches at Augusta.

WASHINGTON CITY, *Monday*, — — — —, 1 a. m.

INDICATIONS FOR THE SUCCEEDING TWENTY-FOUR HOURS.

For *New England*: Fair weather, followed by increasing cloudiness and local rains; southerly winds; lower barometer; slight rise in temperature.

For the *Middle Atlantic States*: Fair weather; south to west winds; lower barometer; higher temperature.

For the vicinity of *New York and Philadelphia*: Warmer, fair weather.

For the *Gulf States*: Fair weather; southerly winds; lower barometer; stationary temperature.

For the *Ohio Valley and Tennessee*: Fair weather; westerly, veering in the northern part to northerly, winds; lower temperature.

For the *Lower Lake Region*: Fair weather, followed by local rains; southwesterly, shifting to northwesterly, winds; falling, followed by rising, barometer; lower temperature.

For the *Upper Lake Region*: Local rains, followed by clearing weather; winds shifting to cooler northerly; higher barometer.

For the *Upper Mississippi and Missouri Valleys*: Fair weather; northerly winds; higher barometer; lower temperature.

For *Colorado*: Colder, fair weather.

RIVERS.—The Ohio will fall above Louisville; the Tennessee will rise at Chattanooga; and the Savannah will rise at Augusta.

SIGNALS.—Cautionary signals continue at Oswego, Charlotte, Buffalo, Erie, and Cleveland, and are ordered for all stations on the Atlantic coast from Chincoteague, Va., to Eastport, Me. (Ins. 131, 1884.)

SPECIAL PREDICTIONS FOR TUESDAY.—Frosts and freezing weather are indicated for the Missouri Valley, and thence southward to Northern Texas. Warmer, fair weather is indicated for the Middle Atlantic States and New England.

THE SPECIAL BULLETIN.

104. Immediately after the completion of the synopsis and indications from the a. m. reports, a "special bulletin" will be prepared daily, except Sunday. In the bulletin no reference will be made to barometric conditions, and all technical terms, such as pressure, barometer, &c., will be avoided. It will begin with the most important feature as determined from the reports of the last twenty-four hours; will announce the approach of hot and cold waves; of frosts; the river conditions when dangerous floods exist or are anticipated; the movements of well-defined storms, giving the direction and naming the districts where they will be most severe; the amount of unusual changes in temperature, in general terms, and the current temperature at the several stations where the change has been greatest; the actual rainfall exceeding 1 inch in twenty-four hours for selected stations; the first appearance and movements of locusts; and will contain all data relative to cold-wave signals. Storms and temperature waves will be treated as specifically as possible, and their progress carefully traced from day to day. (Ins. 140, 1884.)

105. The bulletin will close with such indications of weather, storm movements, and river changes as it may be possible to make for the succeeding thirty-six or forty-eight hours. The indications referring to the movements of freshet waves, when practicable, will be given for several days in advance. When frosts which may prove injurious to crops are likely to occur, the bulletin will contain special warnings of their approach, which the officer in charge will telegraph to the observer at stations in the threatened districts with directions to give them the widest distribution.

106. Special temperatures will be given as follows: 7 a. m. temperatures from June 1 to September 30, from Eastport, Montreal, Quebec, Mount Washington, Cleveland, Alpena, Duluth, Saint Paul, Denver, and San Francisco; and from November 1 to April 30, the 3 p. m. temperatures from Washington, Norfolk, Savannah, Atlanta, Jacksonville, Pensacola, New Orleans, Galveston, Los Angeles, and San Diego.

107. The officer in charge will, whenever possible, incorporate in the special bulletin probable changes in the weather in the lake regions and Upper Mississippi and Missouri Valleys, and telegraph the same to the observer at Baltimore, Md., who will furnish a copy to the secretary of the Baltimore Corn and Flour Exchange. (Ins. 28, 1883.)

108. The 10 a. m. special bulletin will be printed in a manner similar to the model bulletin on file in the correspondence and records division, and will be posted in frames at all places where the morning weather chart is displayed. (Ins. 46, 1881; Ins. 80, 1882.)

109. On the first day of each month the officer in charge of the indications division during the preceding month will prepare a special bulletin, in which will be incorporated general remarks on the mean temperature and total precipitation of that month in the several districts, together with brief descriptions of damaging frosts, severe storms, &c., which may have occurred during the same period. The bulletin will close with special directions to those receiving it to give it the widest publication. A copy of the bulletin will be sent direct to the printer before 3 p. m. of the first day of the month, and will be printed in the same manner as the daily special bulletin. The edition will consist of three hundred copies. (Ins. 87 and 108, 1884.)

SPECIAL PREDICTIONS.

110. At the close of the indications prepared from the 11 p. m. reports, such indications of weather, storm movements, and river changes will be added as it may be possible to make for the succeeding forty-eight hours.

111. In making special predictions the officer in charge of the indications division will use the names of the districts as shown on the district map. (L. R. 6679, Mis., 1884.)

STORM WARNINGS.

112. Cautionary signals will be ordered whenever the officer in charge considers it probable that there will occur at the cautionary signal station, or within 100 miles of it on any navigable water, a wind-velocity dangerous to navigation, i. e., reaching a velocity of 25 miles an hour as registered by the anemometer on land. If, at the next regular report following the ordering of signals, it appears that the danger is not so imminent as to justify the display, the signal will be ordered down. (G. O. 28, 1873.)

113. Cautionary off-shore signals will be ordered whenever the officer in charge considers it probable that there will occur at any cautionary signal station on the Atlantic or Gulf coasts dangerous winds blowing in an off-shore direction. The indications officer will assume the undivided responsibility for the display or lowering of all signals. Conditional orders for such display or lowering will not be issued. (L. R. 6679, Mis., 1884.)

114. Signals will be ordered up in the words "Up signals," or "Hoist off-shore signals," and will be ordered down in the words "Signals down." Off-shore signals will be changed to cautionary signals in the words "Change off-shore signals to cautionary." If the off shore signal is displayed and the wind at the time of the receipt of the order "Signal down" has a velocity of 25 miles or more per hour, the signal will be kept displayed and the velocity of the wind will be ascertained from the self-register at least once in each hour. As soon as the velocity has fallen below 25 miles in any one hour, the signal will be lowered. (L. R. 6679, Mis., 1884.)

115. Whenever cautionary signals are ordered for a storm and the danger from the storm has passed and the signals are continued in anticipation of a second dangerous storm, a special explanatory message will be sent to the stations interested. (Ins. 63, 1880.)

116. The officer in charge will accompany all orders for the display of the several storm-signals with a brief and carefully drawn explanatory message, on Form 206. (Ins. 53, 1884.)

117. When cautionary or other signals are ordered up or down at the stations on the lakes or the Gulf, notification will be sent by telegraph to other stations in the same locality, as directed below. The notification, besides the information that "up," "off-shore," "down signals," &c., are ordered for other stations, will contain the explanatory message embraced in the cautionary order.

118. When signals are ordered up or down at any of the stations on the Gulf coast, viz, Key West, Cedar Keys, Pensacola, Mobile, New Orleans, Port Eads, Galveston, and Indianola, notifications will be sent to all of these stations.

119. When signals are ordered up or down on the lakes notifications will be sent to stations as follows:

Signals ordered on Lake Superior, to stations on Lakes Superior, Huron, and Michigan; signals ordered on Lake Michigan, to stations on Lakes Michigan, Huron, and Erie; signals ordered on Lake Huron, to stations on Lakes Huron, Erie, and Ontario; signals ordered on Lake Erie, to stations on Lakes Erie, Ontario, and Huron, and to Mackinaw City; signals ordered on Lake Ontario, to stations on other lakes. When signals have been ordered displayed at one or more stations on one of the lakes, and due notification has been given, notification of the ordering of additional signals on that lake will not be sent to stations on other lakes. These notifications apply to orders to display, and the orders for lowering signals.

120. The kind of signal shown at Sandy Hook, New Jersey, will be the same as that at New York City. (Ins. 1, 1884.)

121. The officer in charge may give a more extended notification of the ordering of signals when, in his opinion, necessary. (Ins. 91, 1882.)

122. Display boards showing stations where cautionary signals are up, together with the kind of signal, will be kept in the indications division. (L. R. 6679, Mis., 1884.)

123. The officer in charge will verify the orders for display and discontinuance of signals and the record on the display bulletin-board, after which the order will be numbered and entered in the cautionary-signal order book and sent to the telegraph room.

124. At midnight, after completing the press report and special bulletin, and issuing the necessary signal orders, if any, the "good night" message will be prepared, copied in the "signal-order book," verified, and sent to the telegraph room.

125. Whenever a storm is anticipated from Cape May, N. J., to Cape Henry, Va., cautionary signals will be ordered for Baltimore, Md. They will be considered justified whenever the wind at any of the stations from Cape May to Cape Henry, inclusive, reaches a velocity of 25, or more, miles per hour. (Ins. 109, 1883.)

STORM WARNINGS. (CANADIAN SERIES.)

126. Whenever the conditions indicate dangerous weather in the Dominion of Canada, a message will be transmitted to Professor Carpmael, Toronto, Canada, on the usual form in cipher. The cipher words for districts are:

Collingwood for Georgian Bay, Saugeen for Lake Huron, Kingston for East Ontario,

Toronto for West Ontario, Stanley for Lake Erie, Montreal, Quebec, Father Point, Gaspé, Bathurst, Shediac for North New Brunswick, Saint John, Pictou for North Nova Scotia, Halifax, Sidney, Yarmouth.

127. The cipher words expressing time and date, published in the cipher book issued from this office, will be used to indicate the time and date when a storm may be expected, thus:

"Storm (or severe storm) Saugeen, Collingwood, Stanley, Cash; Toronto gaul; Kingston neck; Montreal, Quebec, cat;" by which it will be understood that a storm (or severe storm) is expected to reach Saugeen, Collingwood, and Stanley between 7 a. m. and 3 p. m. (75th meridian time), on the 10th; Toronto between 3 p. m. and 11 p. m. on the 10th; Kingston between 11 p. m. on the 10th, and 7 a. m. on the 11th; Montreal and Quebec between 7 a. m. and 3 p. m. on the 11th.

128. When danger is past or no longer threatens any Canadian station that has been warned, a dispatch will be sent to Professor Carpmæl, containing the following words:

(1) Safety; (2) name of station or stations; (3) date and time (cipher word). A "good-night" message will also be sent to Professor Carpmæl at midnight.

129. All messages relating to storm-warnings will be verified in the same manner as original orders and entered in the cautionary-signal order book, but not numbered.

130. A telegram will be sent at or before 9.30 a. m. each Sunday to the director of the Magnetic Observatory at Toronto, Canada, giving the following information:

If there be no definite warnings for Canadian stations based on the current morning reports, and no expectation that there will be any founded on the afternoon reports of the same day, and any warnings sent on the previous day have been acknowledged, the absence of danger will be expressed by the words "nothing coming."

If warnings have been sent, based on Saturday afternoon or night reports, for which acknowledgments have not been received, the fact will be expressed by the words "Saturday afternoon," or "Saturday night," as the case may be, followed by the names of stations for which warnings have been sent.

If the morning reports do not make the immediate issue of warnings necessary, but indicate that there is a fair probability that a warning may be necessary after the receipt of the afternoon reports, this information will be expressed by the words "Sunday evening," with the names of the stations at which the warning will probably be needed.

Warnings based on the current reports will be sent in the usual manner. (Cir. 23, 1874.)

FROST.

131. Officers will carefully study the meteorological conditions preceding damaging frosts. Such as threaten any crop or fruit will be announced in indications or by special telegraphic bulletins as early as consistent with reasonable safety, and, if possible, two or three days in advance. These frost warnings will define the regions threatened, state the time, and distinguish between *frosts* and *freezing* weather. The officer in charge will call upon the other members of the indications board for their opinion as to the minimum temperature to be expected and the area threatened. (Ins. 154, 1881; Ins. 155, 1882.)

132. During the period of navigation when freezing temperatures are anticipated in any canal region, special forecasts will be made in the indications and special bulletin.

133. Whenever minimum temperatures of 40° or less are expected frost warnings will be telegraphed to the centers named in the several schedules filed in the indications and telegraph divisions: For the fruit-growing regions, from November 15 to April 15; for the tobacco-growing regions, from September 1 to November 1, or until after killing frosts; for the sugar-growing regions, from October 1 to February 1, or until after killing frosts; for the fruit and vegetable districts about Chattanooga, Tenn., from September 15 to May 1; for districts about Georgetown, S. C., from October 1 to April 1. (Ins. 69, 1879; Ins. 128, 1882; Ins. 6, 21, 24, and 31, 1883.)

134. The frost warnings for the sugar-growing regions of Louisiana will be telegraphed to the Signal Service observer at New Orleans, who will promptly furnish a copy to the secretary of the Louisiana State weather service. The officer in charge of indications will exercise great care in preparing these warnings and make them descriptive of the conditions expected to occur in the northern and southern parts of the State; he will also give the time at which the cold-wave or frost will probably reach the State. Warnings will not be given unless light frosts are expected at least in the northern section of the sugar-growing region; and when the temperature will probably fall below, or to, freezing in any section of the sugar-growing region it will be so stated. (Ins. 123, 1884.)

135. Special frost indications will be prepared for Iowa, Minnesota, Dakota, and other of the extreme Western States, and telegraphed to the Signal Service observer at Pittsburg, Pa. (Ins. 106, 1883.)

136. The following table shows the present arrangement for the distribution of frost warnings, subject to such modifications as may become necessary from time to time:

Center or station.	Address.	Center or station.	Address.
<i>Sugar and fruit-growing interests.</i>		<i>Tobacco-growing interests—Cont'd.</i>	
Charleston, S. C.	Observer.	Hartford, Conn.	Manager Western Union Telegraph office.
Chattanooga, Tenn.	Observer, he to furnish copies to the press and to the Mission Ridge Fruit-Growers Association.	Lancaster, Pa.	Do.
Columbia, Tex.	J. S. Smith.	Lexington, Ky.	Do.
Galveston, Tex.	Observer.	Louisville, Ky.	Observer.
Georgetown, S. C.	David Raley.	Lynchburg, Va.	Do.
Jacksonville, Fla.	Observer.	Madison, Wis.	Manager Western Union Telegraph office.
New Orleans, La.	Do.	Memphis, Tenn.	Observer.
<i>Orange-growing interests.</i>		Nashville, Tenn.	Do.
Boston, Mass.	Do.	New Haven, Conn.	Do.
Philadelphia, Pa.	Do.	New York City.	Do.
<i>Tobacco-growing interests.</i>		Palmer, Mass.	Manager Western Union Telegraph office.
Asheville, N. C.	Penniman & Co.	Philadelphia, Pa.	Observer.
Cincinnati, Ohio	Observer.	Raleigh, N. C.	Manager Western Union Telegraph office.
Elmira, N. Y.	Manager Western Union Telegraph office.	Richmond, Va.	Do.
Hannibal, Mo.	Do.	Do.	W. H. Greene, superintendent Richmond and Danville Railroad.
Harrisburg, Pa.	Do.	Saint Louis, Mo.	Observer.
Do.	Superintendent of telegraph, Reading Railroad Company.	Springfield, Mass.	Manager Western Union Telegraph office.
		Washington, City	Observer.
		Wilmington, Del.	Manager Western Union Telegraph office.
		York, Pa.	Do.

COLD WAVES.

137. A square white flag, with black square in center, will be displayed at stations upon receipt of telegraphic orders from this office, to indicate that a "cold wave" is approaching, and will be designated the "cold-wave signal."

Whenever a decided fall in temperature is expected to occur at any of the stations named in paragraph 138, the officer in charge of the indications division will telegraph the observer in the following form: "Hoist cold-wave signal; temperature will probably fall — degrees during next — hours."

Great care must be exercised in ordering cold-wave signals, and, if possible, they will be ordered in season for the observers at printing stations to give notice in the Farmers' Bulletin of the coming cold wave.

When the temperature has reached the minimum, the cold-wave signal will be ordered down by telegraph, thus: "Cold-wave signal down." (Ins. 105, 1884.)

138. The following is a list of stations at which cold-wave signals will be displayed:

Albany, N. Y.; Atlanta, Ga.; Auburn, Ala.; Augusta, Ga.; Baltimore, Md.; Bangor, Me.; Boston, Mass.; Buffalo, N. Y.; Burlington, Iowa; Cairo, Ill.; Charleston, S. C.; Charlotte, N. C.; Chattanooga, Tenn.; Chicago, Ill.; Cincinnati, Ohio; Cleveland, Ohio; Columbus, Ohio; Concordia, Kans.; Davenport, Iowa; Denver, Colo.; Des Moines, Iowa; Detroit, Mich.; Dodge City, Kans.; Dubuque, Iowa; Galveston, Tex.; Grand Haven, Mich.; Greencastle, Ind.; Indianapolis, Ind.; Jacksonville, Fla.; Kansas City, Mo.; Keokuk, Iowa; Knoxville, Tenn.; Leavenworth, Kans.; Little Rock, Ark.; Logansport, Ind.; Louisville, Ky.; Lynchburg, Va.; Madison, Wis.; Memphis, Tenn.; Milwaukee, Wis.; Montgomery, Ala.; Nashville, Tenn.; New Haven, Conn.; New London, Conn.; New Orleans, La.; New York City; Norfolk, Va.; Omaha, Nebr.; Philadelphia, Pa.; Pittsburg, Pa.; Portland, Me.; Rochester, N. Y.; Saint Louis, Mo.; Saint Paul, Minn.; Sandusky, Ohio; Savannah, Ga.; Shreveport, La.; Springfield, Ill.; Toledo, Ohio; Vicksburg, Miss.; Washington City; Wilmington, N. C.

139. Orders relating to cold-wave signals for Kansas City will be addressed to T. S. Case, postmaster, and dispatcher's office, Fort Scott and Gulf Railroad. Orders for Auburn, Ala., will be addressed to P. H. Mell, jr. (L. R. 6679, Mis., 1884.)

140. Whenever cold-wave signals are ordered for Columbus, Ohio, similar warnings will be telegraphed to the director, Ohio meteorological bureau, Columbus, Ohio. (Ins. 2, 1885.)

141. Whenever cold waves are expected to occur in the vicinity of the Baltimore and Ohio Railroad, the officer in charge of the indications division will telegraph

warnings of their approach to Superintendent Seldon, Baltimore; General Superintendent Zenblin, Chicago, and Superintendent Leslie, New York City. The warnings will contain the names of the States in which the cold waves are expected. The following list comprises the States over which the Baltimore and Ohio system chiefly operates: New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Indiana, Illinois, and Kentucky. (Mem. 127, 1884.)

142. A display board showing where cold-wave signals are up will be kept in the indications division. (L. R. 6679, Mis., 1884.)

143. Cold-wave signal orders will be verified by the officer in charge, entered in the cold-wave signal order-book, and checked with the display board, after which they will be sent to the telegraph room. (L. R. 6679, Mis., 1884.)

144. During his tour of duty the officer in charge of the indications division will make a study of approaching changes of temperature as indicated in the Northwest, Montana, Manitoba, and Dakota, and adjacent sections, with a view of determining rules of value in predicting cold and warm waves. A careful study of the charts on file for past years will probably indicate practical rules of great value. In connection with the foregoing he will include a special study of atmospheric changes which precede frosts. (Ins. 100, 1884; Mem. 78, 1884.)

FLOODS.

145. The river reports will be entered on a special form and the changes briefly noted in the synopsis. Whenever greater than 12 inches they will be stated thus: "The rivers have risen (or fallen) at" [here give the names of stations and amount of change]; or "decidedly risen (or fallen) at ———"; or give the number of feet, where the change is remarkable. When the river is near or above the danger-line at any place all changes will be noted. When the probable changes may be of great importance they will also be mentioned in the special bulletin. (G. O. 23, 1873.)

146. Telegraphic warnings may be sent at the discretion of the officer in charge to all districts menaced by dangerous floods.

147. Whenever danger from floods in the Potomac River is anticipated, and word is sent to the merchants of Georgetown and to the press at Washington, &c., of such impending floods, a duplicate message will be sent by the officer in charge of indications to the superintendent of the United States carp ponds, through the Telephone Exchange and National Museum. (Ins. 17, 1884.)

NORTHERS.

148. When "northers" are anticipated telegraphic warnings will be sent to the regions menaced according to the schedule in the indications division, subject to modification from time to time.

Co-operating railroad.	Central distributing station.	Persons addressed.
Burlington and Missouri River Railroad, Nebraska.	Omaha, Nebr.	General manager.
Atchison, Topeka and Santa F6 Railroad ..	Topeka, Kans.	Superintendent of telegraph.
Missouri Pacific Railway	Saint Louis, Mo.	Superintendent of transportation.
Saint Louis and San Francisco Railway	Springfield, Mo.	Superintendent of telegraph.
International and Great Northern Railroad	Palestine, Tex.	Assistant superintendent of telegraph.
Dallas and Wichita Railroad	Dallas, Tex.	General manager.
Texas and Saint Louis Railway	Pine Bluff, Ark.	General superintendent.
Texas and Pacific Railway	Marshall, Tex.	Superintendent of telegraph.
Houston and Texas Central Railway	Houston, Tex.	General superintendent.
Galveston, Harrisburg and San Antonio Railway.	do.	Do.
Mexican National Railway	Corpus Christi, Tex..	Do.

TORNADOES.

149. The officer in charge of indications will carefully study the tri-daily weather charts of previous years, with a view of becoming familiar with the atmospheric conditions which are likely to exist during the occurrence of tornadoes in the various sections of the country.

150. When the current weather report is such as to indicate the probable occurrence of tornadoes, the indications prepared from such report will contain special warning, in the following form:

"Dangerous local storms, or violent local storms are indicated for ———" (naming districts or States).

These warnings will be telegraphed to the Signal Service stations in the threatened districts. The word "tornadoes" will not be used in making these forecasts. (Ins. 60, 1883.)

LOCUSTS.

151. The first appearance and subsequent movement of locusts when reported to this office will be mentioned in the special bulletin and synopsis.

RAILWAY WEATHER SIGNALS.

152. The officer in charge of the indications division will telegraph to Prof. P. H. Mell, jr., director Alabama State weather service, Auburn, Ala., at 1 a. m., daily, special weather forecasts for the ensuing day for the State of Alabama.

The forecasts will contain predictions of temperature, whether higher, lower, or stationary; general rain, local rain, or fair weather; and will be telegraphed in conformity with the following system of flag signals:

White.	Fair weather.	White.	Fair weather.
Yellow.	Higher temperature.	Blue.	Stationary temperature.
Yellow.	Local rains.	Yellow.	Local rains.
Blue.	Stationary temperature.	White.	Lower temperature.
Blue.	General rains.	Blue.	General rains.
White.	Lower temperature.	Yellow.	Higher temperature.
Yellow.	Local rains and higher temperature.	Blue.	General rains and stationary temperature.

The forecasts will be telegraphed in the exact words printed opposite the signals, as shown herein. (Ins. 107, 1884.)

152a. Since the adoption of the above signals by the Alabama weather service, the system has been superseded by the following :

EXPLANATION OF SIGNALS.

PREPARATION OF INDICATIONS.

The weather indications furnished to the State by the Chief Signal Officer are based on observations taken in all parts of the country three times a day. The morning indications are prepared at 11 p. m. (eastern standard time) of the preceding night, and hold good till the following morning.

DISPLAY OF FLAGS.

In accordance with these indications the proper official flags should be selected and promptly displayed. If elevated on a pole, they should be so arranged as to read downward. If the indications read _____ followed by _____, then a space, the width of a flag, should be left vacant on the pole to indicate "*followed by.*" The signals should be withdrawn at 3 p. m.

MEANING OF FLAGS.

No. 1 [white flag] refers always to fair or clear weather.

No. 2 [orange flag] refers always to local rains.

No. 3 [blue flag] refers always to general rains.

No. 4 [black triangle flag] refers always to temperature. When placed above either Nos. 1, 2, or 3 indicates rising temperature; when placed below these numbers (1, 2, or 3) indicates falling temperature, when absent from the pole stationary temperature is indicated.

No. 5 [white flag with black square] refers always to decidedly colder weather, and is generally issued twenty-four hours in advance of the expected fall of temperature. This signal is not ordered unless it is expected that the temperature will fall to 45 degrees Fahrenheit, or below, within the time stated in the order.

No. 6 [orange flag with black square] indicates the approach of a cyclonic wave.

EXAMPLES.

"Cooler, fair weather," display flag No. 1 with No. 4 below it.

"General rains, higher temperature," display No. 3 with No. 4 above it.

"Stationary temperature and local rains," display No. 2 only.

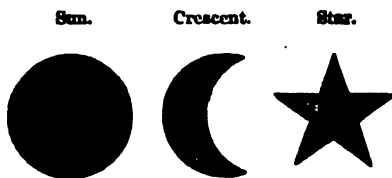
"Stationary temperature and general rains, followed by cooler clear weather," display No. 3 (space) and No. 1 with No. 4 below it.

Public notice of these explanations should be secured in local newspapers as generally as possible, and by posting this card near the point of display where it can be examined by the public.

153. The officer in charge of the indications division will telegraph to the director, Ohio meteorological bureau, Columbus, Ohio, at 1 a. m., daily, special weather forecasts for the ensuing day for Ohio. An additional telegram will be forwarded at 10 a. m., whenever sudden changes render it necessary.

154. The forecasts will contain predictions of temperature, whether higher, lower, or stationary; general rain or snow, local rain or snow, or fair weather; and will be forwarded in conformity with the adopted system of signals.

155. The signal will consist of two figures which differ in color, being red or blue, and in form being shaped like the sun, a crescent, or a star. The red color refers to the temperature, and the blue color to the state of the weather, as rainfall or snow; they are used as below :

Railway weather signals.

Red.—Sun, higher temperature; crescent, lower; star, stationary.

Blue.—Sun, general rain or snow; crescent, clear or fair weather; star, local rain or snow.

Similar forecasts will be prepared for the region of the following-named railroads and telegraphed at 1 a. m., daily:

Cumberland Valley Railroad, General J. F. Boyd, superintendent, Chambersburg, Pa.

Frederick division, Pennsylvania Railroad, J. B. Hutchinson, superintendent, York, Pa.

The officer in charge of the indications division will send or designate the symbols to be used, and will not telegraph the written indications. (Ins. 31, 1884.)

The 11 p. m. indications for New England will also be sent by this code, except that the flag will be designated by numbers instead of by symbols, as follows: Red sun, flag No. 1; red crescent, flag No. 2; red star, flag No. 3; blue sun, flag No. 4; blue crescent, flag No. 5; blue star, flag No. 6.

INDICATIONS BOARD.

156. The "indications board" will be permanently organized, the personnel of which will be announced from time to time.

157. The members of the board will successively perform, for one month each, the following duties:

- (a) Indications.
- (b) Inspection of stations.
- (c) Fact and international bulletin division.
- (d) Charge of instruction and personal study.

158. The members present will assemble at 10 o'clock a. m., daily, in the indications room, to study and discuss all meteorological conditions, but the indications officer will prepare his indications and bulletin independently, and will be responsible for them.

159. When the seasons arrive at which frosts, floods, northers, or the flights of locusts may be expected, each member of the board present will inspect daily the meteorological conditions of the country to discover any danger from these causes, and will on occasion notify the senior officer present, who will at once call the full board together for further study and consultation upon the subject.

160. The senior officer of the board present will have general charge during sessions of the board, and will be responsible for the proper performance of its work, in accordance with the published regulations. The officer specially detailed on indications for the current month will be responsible for all indications, signal orders, and special bulletins during his tour, availing himself of the advice of the board when he so desires.

161. It is the duty of any member of the board to notify the officer in charge of the indications division of any weather indications which he thinks may have escaped attention.

162. All communications affecting the work or duties of the board will be transmitted through the senior officer to the Chief Signal Officer.

163. The board will report daily, in writing, to the Chief Signal Officer the result of the previous day's work, embracing in the report of the board all omissions or other matters seeming to require attention, including those, if any, of the indications officer.

164. Verifications of predictions will be made by the board. (Ins. 89, 1883.)

VERIFICATIONS OF INDICATIONS.

165. The indications board will determine the percentage of verification of the current indications in accordance with the following instructions:

(a) The percentage of verifications of wind predictions will be determined by considering only the direction.

(b) The indications made up from each report will be compared with the facts shown by the three succeeding tri-daily reports.

(c) In estimating the percentages, ascertain whether the conditions predicted for each district have prevailed in it to the amount of one-fourth, one-half, three-fourths, or the whole of the area of the district.

(d) Predictions which are found to be more than three-fourths verified will be considered completely verified, and represented by 100 or 100 per cent. in that column of the blank to which the prediction refers. Predictions which are not wholly verified will be represented in the proper column of the blank by 75 per cent., 50 per cent., or 25 per cent., as the facts may warrant. Predictions which have fallen below 25 per cent. in verification will be rated as not verified and represented by 0 in the proper column.

(e) If, in the indications for any particular district, any class of predictions is not referred to, such omissions will be represented by a dash (—).

(f) To determine the percentage of verification, divide the sum of the percentages of a single class for the month by the number of predictions made of that class. To determine the percentage of verifications for any district, divide the sum of the percentages of the several classes of predictions by the number of classes. To determine the percentage of verification for the United States, divide the sum of percentages of verifications by the number of districts.

(g) A maximum percentage of verification can be got only when the four elements under each district are named in the indications of the entire month.

(h) To determine the percentages of failures to predict for any element, divide the number of failures to predict for that element by the entire number of tri-daily reports during the month. (G. O. 23, 1873; Cir. 7, 1874.)

(i) The indications for the three districts on the Pacific coast will be verified as to weather according to the usual rule, and will be published in the general percentages of verifications. (Ins. 17, 1879.)

(j) The indications will be verified from a printed copy first corrected by the assistant in charge of the indications division. (Ins. 9, 1881.)

(k) the statement of percentage of signals justified, &c., will show the number of storms reported with wind velocity of 25 miles or over per hour for which cautionary signals have not been ordered. (Ins. 24, 1880.)

(l) Indications of barometer changes will be verified and counted in making up the monthly average of verifications. (Ins. 69, 1884.)

(m) In verifying temperature in special predictions, the three charts of the day for which the prediction is made will be compared with the three corresponding charts of the preceding day.

(n) If at the time the prediction is made, precipitation is actually taking place, and precipitation is predicted, the prediction will not be considered fully verified unless precipitation is recorded on the second chart.

(o) The expression "continued cold" or "continued warm" weather, when used, will be understood to mean that the temperature will remain stationary.

(p) When light variable winds are predicted, any "calms" reported will be considered in verifying as "variable."

(q) The expression "partly cloudy" will be understood to mean totally cloudy at a portion of the stations.

(r) When fair weather is predicted and rain occurs within twenty-four hours the prediction will be verified on the basis of the area of rainfall in the district, giving zero for rain occurring over the entire district.

(s) In order to fully verify the prediction, "local rains followed by fair weather," precipitation must occur on the first or second charts, and no precipitation be reported in three-fourths of the district on the last chart.

(t) When "colder" or "warmer" weather, preceded by a "rise" or "fall" in temperature is predicted, the prediction for "colder" or "warmer" will be considered as applying to the twenty-four hour prediction.

REPORTS.

166. A tri-daily report of the time of completion and delivery of the daily publications of the indications division will be made in the form given below. The indications officer will lay these three reports on the Chief Signal Officer's table not later than 12 noon daily.

[Form No. 425 g—1885.]

Indications officer's tri-daily report.

Date, _____ Hour, _____ Messenger's name, _____.

Time delivered.	Special bulletin.	Farmers' bulletin.	Time delivered to messenger.	To whom delivered.	Time of delivery to be entered by receiver.	Signature of receiver.
				N. Y. Associated Press	Tri-daily list—always first.	
				U. S. Associated Press		
				W. U. Tel. Co		
				B. & M. Tel. Co		
				W. E. B., 511 14th St		
				B. & P. Depot	Daily list.	
				Secretary of War		
				Critic		
				Star		
				Post		
				Republican	Weekly list, for Sunday.	
				Post Office		
				Journal		
				Herald		
				Capital		
				Chronicle		

Material for morning map delivered to printer, at _____ a. m.

Map completed and in hands of messenger at _____ a. m.

I certify that the foregoing is a true return for the report and date named.

_____, *Indications Officer.*

NOTE.—The midnight indications will be prepared and delivered to the Associated Press companies not later than 1 a. m. The indications officer will lay these reports on the table of the Chief Signal Officer not later than 12 m.

W. B. HAZEN,
Brigadier and Brevet Major-General, Chief Signal Officer, U. S. Army.

APPENDIX 3.

REPORT OF OFFICER IN CHARGE OF THE DIVISION OF THE PACIFIC.

SIGNAL OFFICE, WAR DEPARTMENT,
San Francisco, Cal., July 27, 1885.

SIR: I have the honor to make the following report of the operations of this division for the year ending June 30, 1885:

Having been informed that I would be ordered to take station at San Francisco, with a view to giving the people of the Pacific coast the full benefit to be derived from the Signal Service, and directed to make the necessary preparations, my time was occupied during December, 1884, and January, 1885, in extracting data from the Signal Service records in the office of the Chief Signal Officer.

In obedience to paragraph 5, Special Order No. 1, Headquarters of the Army, Adjutant-General's Office, Washington, January 2, 1885 (copy herewith marked A), and your letter of instructions of January 6, 1885 (marked B), I left Washington February 2, and reached San Francisco February 11.

In accordance with letter of instructions, War Department, Adjutant-General's Office, Washington, January 2, 1885 (marked C), on February 12, I left San Francisco for San Luis Obispo, Cal. After an examination of that section, including telegraph facilities, &c., I decided upon San Luis Obispo as the best location for a Signal Service station. February 16 I returned to San Francisco. Private George A. Rivière, Signal Corps, U. S. Army, reported to me for duty, having arrived February 15. I proceeded to Red Bluff, Cal., the 17th, and returned to San Francisco the 18th. Private B. S. Pague, Signal Corps, U. S. Army, arrived February 22.

Pursuant to your letter of instructions, Signal Office, War Department, Washington City, January 10, 1885 (marked D), I made an effort, February 25, to underrun the submarine cable between "The Presidio" and Alcatraz Island. With the facilities available it was found impossible to raise the cable; therefore the repair of the same was postponed until sufficient money should be at my disposal to enable me to hire the necessary apparatus for recovering the cable.

I was extremely fortunate in securing from March 1, 1885, rooms Nos. 45 and 46, fourth floor (across the hall from the operating rooms of the Western Union Telegraph Company), No. 302 Montgomery street, for use as an office. On March 21 I left for Monterey and Santa Cruz, Cal., and returned to San Francisco March 23.

The office supplies arrived from Washington March 26. On March 28 the preparation of tri-daily charts from the telegraphic reports began. Privates Pague and Rivière had become sufficiently expert in the preparation of the charts to begin the issue of the synopses and indications for the Pacific districts to the public through the San Francisco daily papers, the Associated Press, and the Farmers' Bulletin, twice daily; at 1 p. m., Pacific time, for the afternoon papers, and 9 p. m., Pacific time, for the morning papers and Farmers' Bulletin, excepting on Sundays at 9 p. m. only. I inclose a sample copy of the charts prepared (marked E), a copy of the synopses and indications (marked F), a copy of the Farmers' Bulletin (marked G), and a list showing the distribution of the synopses and indications (marked H). The percentages of verifications of the indications, made by myself, are:

	Per- cent- age.	Aver- age for district.	Month- ly aver- age.	
APRIL, 1885.				
North Pacific:				
Weather.....	83.5	} 84.4	} 83.62	
Wind direction.....	81.7			
Temperature.....	78.1			
Middle Pacific:				
Weather.....	80.1	} 79.7		
Wind direction.....	78.8			
Temperature.....	71.2			
South Pacific:				
Weather.....	84.9	} 85.8		
Wind direction.....	80.1			
Temperature.....	76.8			

	Per cent- age.	Aver- age for district.	Month- ly aver- age.		
MAY, 1885.					
North Pacific:					
Weather.....	83.8	82.0	87.57		
Wind direction.....	87.7				
Temperature.....	74.6				
Middle Pacific:					
Weather.....	96.1	85.7		87.57	
Wind direction.....	88.1				
Temperature.....	72.8				
South Pacific:					
Weather.....	93.4	95.0			87.57
Wind direction.....	98.7				
Temperature.....	98.0				
JUNE, 1885.					
North Pacific:					
Weather.....	85.3	85.27	89.63		
Wind direction.....	92.0				
Temperature.....	78.6				
Middle Pacific:					
Weather.....	96.4	89.29		89.63	
Wind direction.....	91.1				
Temperature.....	80.4				
South Pacific:					
Weather.....	98.2	94.34			89.63
Wind direction.....	96.4				
Temperature.....	88.4				
General average.....						87.32

Since the opening of this office no cautionary signals have been ordered to be displayed at any of the signal stations along the coast; in fact no dangerous storms have passed over any portion of the coast of the Pacific districts.

At San Diego, Cal., on April 20, the wind reached a velocity of 25 miles per hour, from the west, during clear weather. The observer reports "Storm not considered dangerous to shipping or other interests."

Hourly wind velocities of over 24 miles per hour from a westerly direction have been of frequent occurrence at San Francisco, while clear or partly cloudy weather prevailed. The maximum velocity of 36 miles per hour from the west was recorded June 21. On April 16 four schooners, which had sailed the 15th, returned to port, not having been able to withstand the strong northwest wind and heavy sea. April 26 two schooners returned to port, having had their fore-mast heads carried away by strong northwest winds encountered about 40 miles off Point Tomales, California. The observer reports "These velocities are not considered dangerous to shipping."

At Fort Canby, Wash., a velocity of 25 miles per hour from the south, while light rain was falling, was recorded May 13; 32 miles from the south, with light rain, May 18. The observer reported that "Southerly gales are not considered dangerous on Columbia bar. The display of cautionary signals would have been of no benefit to shipping."

At Port Angeles, on April 14, a velocity of 30 miles per hour from the west, during clear weather, and on June 5, 28 miles from the northwest during clear weather, were recorded. The observer reports "No casualties reported," and his report of February 3, 1885, "In a great measure I do not think there have been any high winds here that could be considered dangerous to the shipping interests by what I have seen and learned from sea-faring men." In all of these cases, if signals had been displayed, they would have been of no value and would have unnecessarily delayed vessels, excepting some small coasting schooners.

I have not as yet been able to determine the danger velocities of winds for the several directions under different conditions of the weather at the various stations, but hope to do so before the stormy season commences.

Through the press, those having special interests to be protected from frost, rain, floods, &c., have been requested to inform me of the same, with the probable dates between which they desired warning, but I have not received any communications upon the subject. In the same manner I have requested those having records of observations of the temperature, direction and force of the wind, rainfall, snowfall, thunder storms, "northers," and destructive frosts, storms, and floods, to send me copies of the same, by months, for past years, and at the close of each month in future. I have to acknowledge the receipt of meteorological records from Mr. Charles W. Friend, Carson City, Nev.; Mr. Robert Hall, Sonoma, Cal.; Mr. H. C. Tower, Santa Monica, Cal.; Mr. George A. Raymond, San Rafael, Cal.; Dr. W. W. Hayes and Sinsheimer

Bros., San Luis Obispo, Cal., through Corporal Thomas Gibson, Signal Corps, U. S. Army; Mr. Albert Dibblee, Fern Hill, near San Rafael, Cal.

Pursuant to instructions contained in your communication of March 19, 1885 (marked I), the Rev. W. H. Weinland was instructed in the duties of an observer. He sailed on May 19, 1885, on the schooner "Lizzie Merrill" for his station Mumtrekhlaga-mut, Alaska.

As per instructions contained in your communication of May 18, 1885 (marked K), Sergeant Nelson Gorom, Signal Corps, U. S. Army, is being instructed in the "indications" work of this office.

In this section the people are especially interested in the rainfall, on account of the effect of the same upon the growing crops. It is believed there are special interests that can be beneficially served.

All my spare time has been devoted to the following: Drawing isobars upon the charts for past years prepared at the office of the Chief Signal Officer for this office; copying data which I extracted from the records of the office of the Chief Signal Officer; making extracts from the Central Pacific Railroad Company's records, newspapers, vessel reports, and records of private individuals; placing available data into suitable shape for quick reference.

Letters received during the year.....	511
Letters written during the year.....	788
Monthly reports received from voluntary observers,.....	41

I am, sir, very respectfully, your obedient servant,

ROBT. CRAIG,

First Lieutenant Fourth United States Artillery,

A. S. O. and Assistant In Charge.

The CHIEF SIGNAL OFFICER U. S. ARMY,
Washington, D. C.

A.

SPECIAL ORDERS, }
No. 1. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, January 2, 1885.

[Extract.]

5. By direction of the Secretary of War, First Lieutenant Robert Craig, Fourth Artillery, acting signal officer, is relieved from duty in this city, and will proceed via Yuma, Ariz., and Los Angeles, Cal., to San Francisco, Cal., and take station at that point, carrying out such instructions as he may receive from the Chief Signal Officer of the Army. The travel herein directed is necessary for the public service.

By command of Lieutenant-General Sheridan.

R. C. DRUM,
Adjutant-General.

B.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, January 6, 1885.

SIR: In carrying out the provisions of paragraph 5, Special Orders No. 1, Adjutant-General's Office, January 2, 1885, the Chief Signal Officer directs, that upon arrival at San Francisco, Cal., you will open a branch signal office for the service of the Pacific coast, and carefully study the whole field, making your office fully acquainted with the entire subject. You will determine what can be done to make the service most useful to the people of the Pacific coast, and render such service, in the way of indications, special predictions, signals, and otherwise as your facilities and means will permit; you will make monthly report to this office, showing, in general and detail, all that you may accomplish.

Very respectfully, yours,

B. M. PURSELL,
Second Lieutenant, Signal Corps, U. S. Army.

First Lieut. ROBERT CRAIG,
Fourth Artillery, Acting Signal Officer and Assistant, Washington, D. C.

A true copy.

B. M. PURSELL,
Second Lieutenant, Signal Corps, U. S. Army.

C.

WAR DEPARTMENT, ADJUTANT-GENERAL'S OFFICE,
Washington, January 2, 1885.

(Through the office of the Chief Signal Officer, U. S. A.)

SIR: The Secretary of War directs, as necessary to the interests of the service, that you proceed from San Francisco to Red Bluff, Cal., and return; from San Francisco to Monterey and Santa Cruz, Cal., and return, and from San Francisco to San Luis Obispo and Los Alamos, Cal., and return to San Francisco, carrying out such special instructions as you may receive from the Chief Signal Officer of the Army.

Very respectfully, your obedient servant,

R. C. DRUM,
Adjutant-General.

First Lieut. ROBERT CRAIG,
Fourth Artillery, Acting Signal Officer.

[1st indorsement.]

SIGNAL OFFICE, Washington City, January 6, 1885.

Respectfully transmitted to First Lieut. Robert Craig, Fourth Artillery, acting signal officer and assistant, Washington, D. C., who will carry out as per verbal instructions received by him from the Chief Signal Officer.

By order of the Chief Signal Officer:

B. M. PURSELL,
Second Lieutenant, Signal Corps, U. S. Army.

A true copy.

B. M. PURSELL,
Second Lieutenant, Signal Corps, U. S. Army.

D.

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, D. C., January 10, 1885.

SIR: The Chief Signal Officer directs that upon your arrival at San Francisco you will at once take steps to recover and repair the sub-marine telegraph cable between the Presidio wharf and Alcatraz Island, recently reported broken by a ship's anchor.

In view of the small amount of money available for this work, you will request the division commander to furnish such assistance by the use of the quartermaster steamer and the labor of troops or prisoners as will reduce expenses to the lowest possible figure.

Such telegraph tools as are not on hand may be borrowed from the Western Union Telegraph Company at San Francisco, as was done on a similar occasion a year ago.

The services of one or more experts may be employed to superintend the recovery of the broken end of the cable and to make the splice; also such other necessary assistance and material as cannot be supplied by the military authorities; but before incurring any expenses you will obtain careful estimates of the probable cost of the entire work and telegraph them to this office for approval.

A sufficient quantity of spare cable is on the spot should it be found necessary to cut out and replace any weak or defective parts near the end of the cable.

The cable was originally laid from Fort Mason to Alcatraz Island, but, being broken by an anchor shortly afterward, was taken up and relaid from the Presidio wharf to the island. This was done by order of the division commander, and because it was thought that injury to the cable would thereafter be of rare occurrence, as vessels seldom anchor near that route.

No change in the present route will be made by you unless you are fully convinced from personal examination and careful inquiries of persons familiar with the locality that it will lessen the danger of injury to the cable; and not then until such change has been approved by the Chief Signal Officer.

A copy of a map showing the location of the cable and connections is inclosed for your information; also copies of telegrams referring to broken cable.

By order of the Chief Signal Officer.

Very respectfully,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

First Lieut. ROBERT CRAIG,
Fourth Artillery, A. S. O. and Assistant, Washington, D. C.

F.

SIGNAL SERVICE U. S. ARMY,
DIVISION OF THE PACIFIC,
San Francisco, Cal., Tuesday, June 30, 1885—9 p. m.*

Synopsis for the past 24 hours.

The barometer is about normal in the South Pacific, and slightly below in the Middle and North Pacific.

The temperature is about normal in all the districts.

The winds have been generally light to fresh and southerly in the South Pacific; light and variable in the North Pacific; variable in the Middle Pacific, with high northerly winds at Cape Mendocino.

Light local rains have fallen in the North Pacific; fair weather has continued in the Middle and South Pacific.

Indications for the succeeding 24 hours.

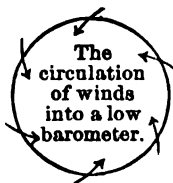
For the North Pacific, cloudy weather, local rains, light variable winds, generally northwesterly, stationary temperature along the coast and cooler over the interior.

For the Middle Pacific, fair weather, followed in northern part by local thunder storm, variable winds, generally southwesterly in southern part, nearly stationary temperature.

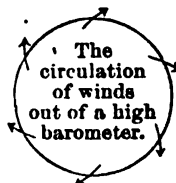
For the South Pacific, fair weather, variable winds, generally southwesterly, stationary temperature.

CRAIG.

G.



[Farmers' Bulletin. War Department, Office of the Chief Signal Officer, Division of Telegrams and Reports for the Benefit of Commerce and Agriculture.]



SAN FRANCISCO, CAL., Thursday, May 28, 1885—9 p. m.

Synopsis for the past 24 hours.

The barometer is slightly above the normal in Washington Territory, and slightly below in Oregon and California, being lowest over Northern California. The temperature is slightly above the normal in the South Pacific, from four to twenty degrees above in the Middle Pacific, and three to fifteen degrees above in the North Pacific. The winds have been variable; generally westerly in the South Pacific and southern part of the Middle Pacific, and northerly in the northern part of the Middle Pacific and southern part of the North Pacific. Fair weather has continued in all the Pacific districts, excepting light rain in the northwestern corner of Washington Territory.

Indications.

For the North Pacific, slightly warmer, generally fair weather, variable winds, generally northwesterly.

* Pacific time.

For the Middle Pacific, fair weather, variable winds, generally southwesterly over the southern part, nearly stationary temperature.

For the South Pacific, fair weather, variable, followed by westerly winds, nearly stationary temperature.

For the Middle Pacific coast region, during the month of May, winds blowing from the southeast to southwest are found to be the winds most likely to be followed by rain. Winds blowing from the north to east are found to be the winds least likely to be followed by rain.

General laws accompanying weather changes in the United States.—Weather changes affecting the locality in which this bulletin is posted generally appear first to the westward. An area of low barometer (storm-center) generally moves slightly to the north of east; an area of high barometer generally moves slightly to the south of east. In advance of the low barometer are generally found rain-winds and increasing cloudiness, with rain or snow; in rear of a low barometer are generally found colder, dry winds and clearing weather.

Meteorological summary for the month of May.

Mean barometer, corrected for temperature and instrumental error, only....	29.944
Mean barometer, reduced to sea-level	30.014
Mean monthly range of barometer.....	0.380
Mean temperature.....	56° 2
Highest temperature (in 1883)	86° 0
Lowest temperature (in 1876, '79, '80, and '82).....	45° 0
Mean monthly range of temperature	30° 8
Average precipitation	0.68
Prevailing wind.....	West.

Published by co-operation of the War and Post-Office Departments.

W. B. HAZEN,
Chief Signal Officer.

H.

LIST OF PAPERS, ETC., RECEIVING THE SYNOPSSES AND INDICATIONS.

1 p. m.—1 for file; 1 for office Chief Signal Officer; 1 for Associated Press (Pacific Coast, M. A. Richardson, agent); 1 for The Evening Bulletin; 1 for The Evening Post; 1 for The Daily Report; 1 for Die Abend Post; 1 for Western Union Telegraph Office (posted in office).

9 p. m.—1 for file; 1 for office Chief Signal Officer; 1 for Associated Press; 1 for The Chronicle; 1 for The Call; 1 for The Alta; 1 for The Examiner; 1 for Le Courrier de San Francisco; 1 for Der Demokrat; 1 for Western Union Telegraph Office (posted in office); 1 for The Commercial News; 1 for the Observer Signal Corps, San Francisco.

J.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, March 19, 1885.

SIR: I am directed by the Acting Chief Signal Officer to inform you that a station of the second order has been ordered established at Muntreklhagamut, Alaska, of which Rev. William H. Weinland will have charge.

Mr. Weinland, who expects to be in San Francisco about the 1st of April, has been requested to call upon you for instruction in the manner of reading our instruments and recording observations, and I have the honor to request that you will satisfy yourself that he has been sufficiently instructed and has a thorough understanding of all the duties of an observer, before he leaves for his station.

Mr. Weinland has also been requested to compare his barometers with yours, to insure this office, that they have not been injured in their transit to San Francisco.

Very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

Lieut. ROBERT CRAIG,
*Acting Signal Officer and Assistant,
Merchants' Exchange, San Francisco, Cal.*

K.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, May 18, 1885.

SIR: The Chief Signal Officer directs that you carefully instruct one of the enlisted men on duty at your station in the "indications" work, so that at any time when it may become necessary for you to leave the station on inspection trip, or for other reasons, the "indications" will be made by this man during your temporary absence.

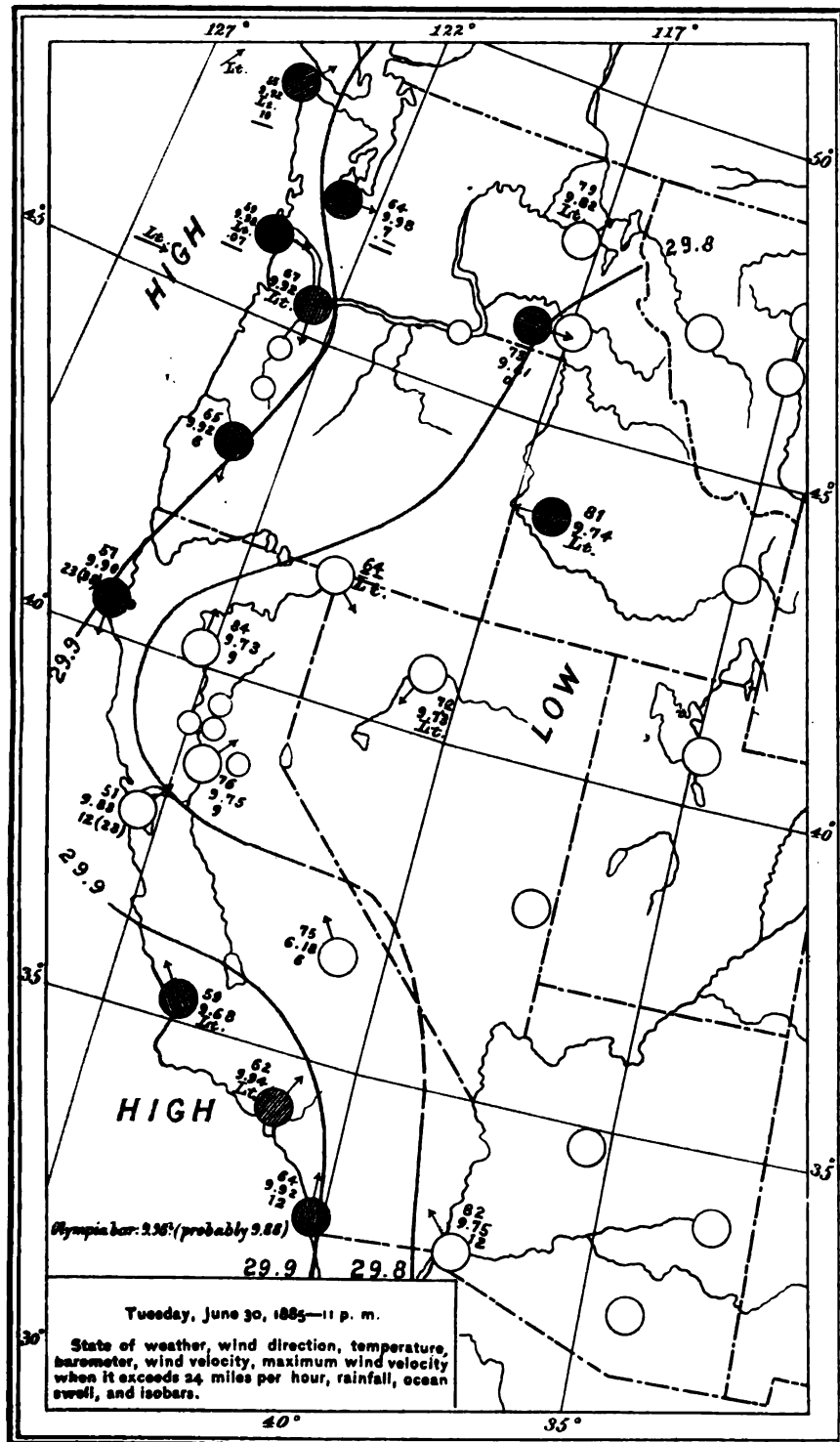
Very respectfully, your obedient servant,

B. M. PURSELL,
Second Lieutenant, Signal Corps, U. S. Army.

First Lieut. ROBERT CRAIG,
*Acting Signal Officer and Assistant,
San Francisco, Cal.*

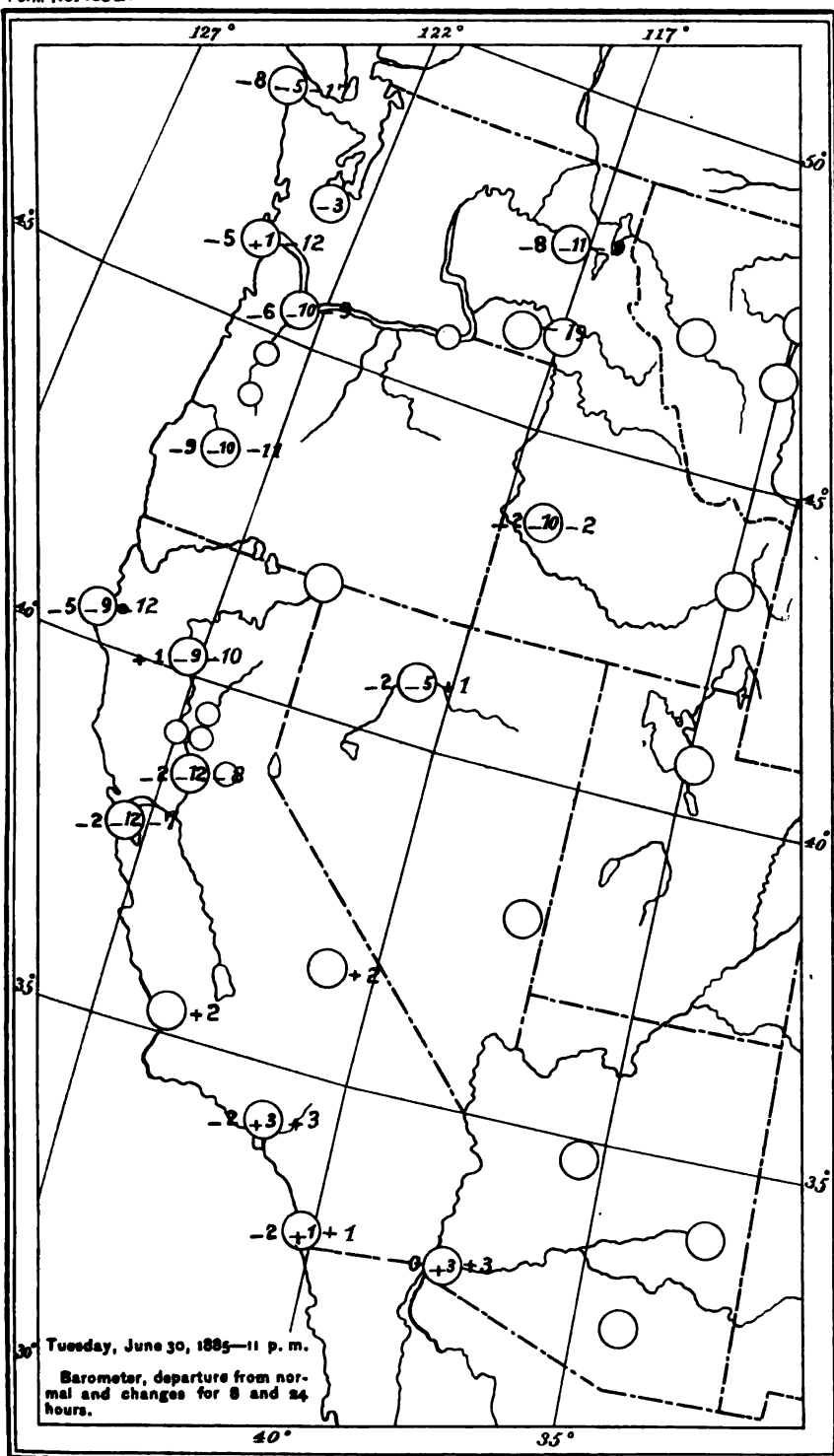
WAR DEPARTMENT WEATHER MAP, SIGNAL SERVICE, U. S. ARMY.

Form No. 106 a.



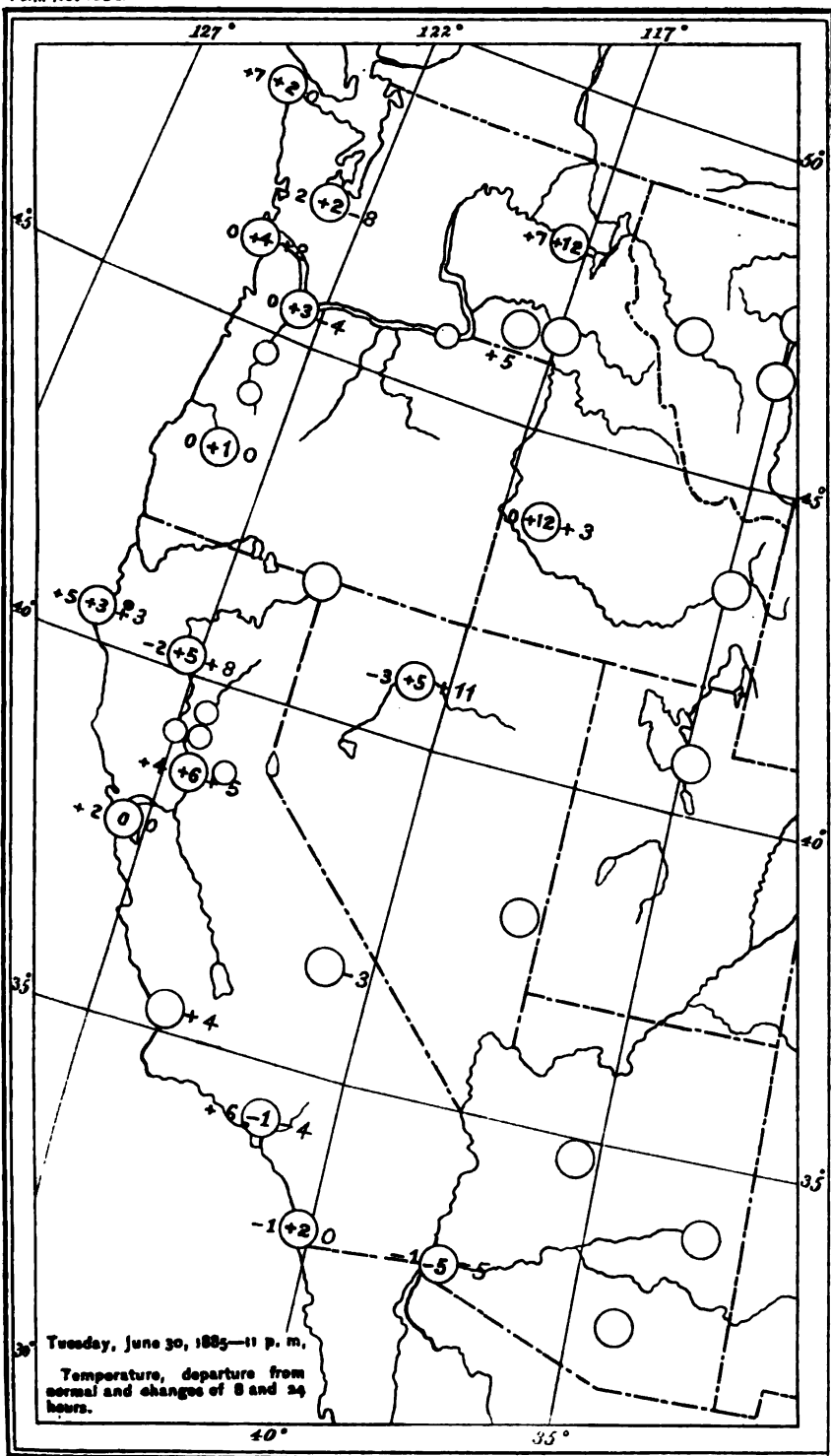
WAR DEPARTMENT WEATHER MAP, SIGNAL SERVICE, U. S. ARMY.

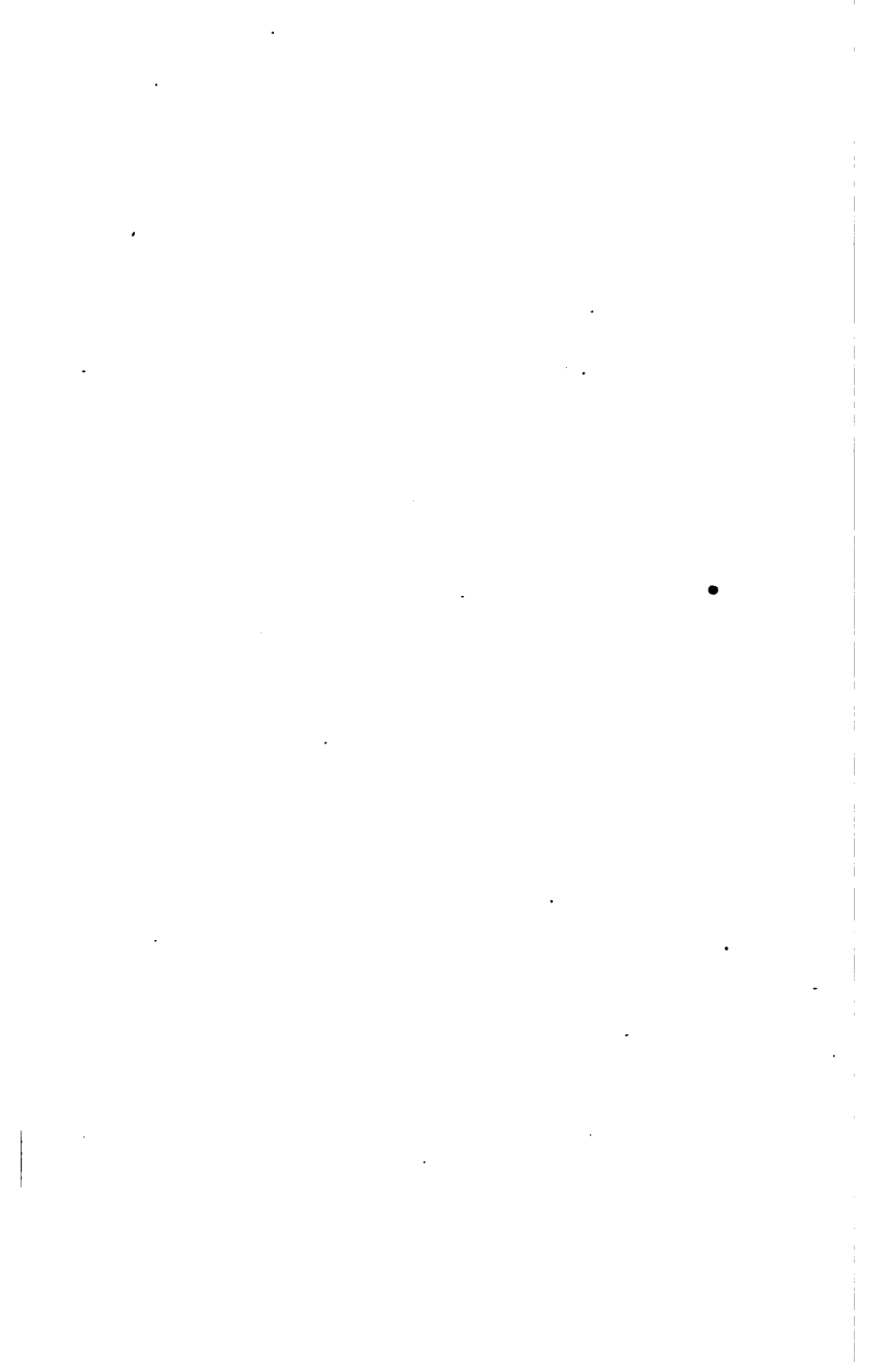
Form No. 106a.



WAR DEPARTMENT WEATHER MAP, SIGNAL SERVICE, U. S. ARMY.

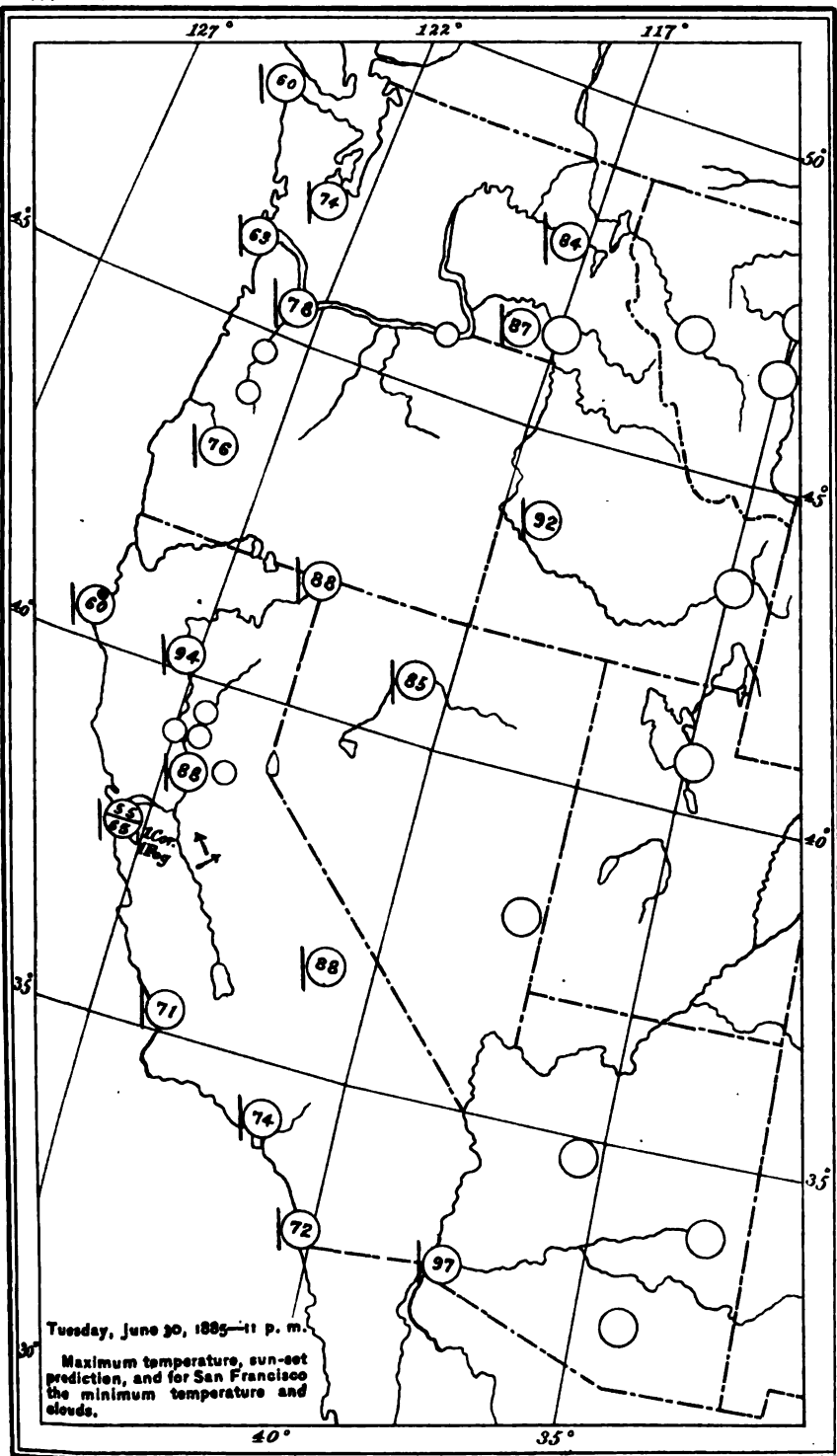
Form No. 106a.





WAR DEPARTMENT WEATHER MAP, SIGNAL SERVICE, U. S. ARMY.

Form No. 106a.



APPENDIX 4.

REPORT OF THE STATIONS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, June 30, 1885.

SIR: I have the honor to report, in outline, the nature of the work performed by the Stations Division during the year ending this day.

The duties of this division are as varied and extensive as they are important, and their increase has been commensurate with the rapid strides taken by the service in meeting the wants of the people for a wider dissemination of the weather reports, weather signals, and information to be obtained only from the records of this office.

This division has general supervision of all paid observers of the Signal Service; of all special cautionary and cold-wave display stations; of the railway weather bulletins; of the instruction of enlisted men of the Signal Corps; of inspectors of the Signal Service, and of the receipt, record, and publication of reports from the above sources.

All correspondence with the enlisted men and civilians on duty at stations in relation to matters connected with their official duties as observers or displaymen is under the supervision of this division.

All directions to stations relative to changes of instruments or elevation of instruments, changes in instrumental corrections or reduction constants, otherwise than by general orders, are issued by this division.

All meteorological records from paid observers are here filed, and in case of destruction of the meteorological records of any station, by fire or otherwise, duplicate copies of those on file at this office are made and sent to the station in question.

The original records of observations, the monthly meteorological summaries, and other meteorological forms received from observers at stations, from displaymen, special river and special cotton-region observers, are here carefully examined for errors and irregularities, the necessary corrections applied, and after final action are filed in the division.

In all matters relating to the meteorological work of the various stations, their establishment, removal, or discontinuance, special instructions are issued and the necessary action taken.

The regular stations of the service displaying cautionary signals and the special display stations have continued in successful operation.

Signals on Lake Superior were discontinued on December 1, and on Lakes Michigan, Huron, Saint Clair, Erie, and Ontario on December 15, 1884.

The very limited balance of the appropriation available for the purpose, made it necessary to delay the opening of the special stations on the lakes until April 15, 1885; but, owing to the backwardness of the spring, the date named proved to be early enough for lake interests.

The number of stations remains about as last year, the appropriation being too small to display signals at any of the many additional points asked for, by parties prominently interested in lake navigation.

During the year all of the special display stations have been inspected, and the reports of the inspectors were very generally satisfactory.

Requests from shipping-men for the resumption of night services of operators have been general, but there being no money for the purpose, the service could not take favorable action in the matter. At present night signals for special display stations are filed in the telegraph office by the observers in charge of the centers, for transmission to the displaymen the following morning.

The river and flood service has continued in active operation. It has been a source of great benefit to river interests generally, and the results of the large increase in the number of observations taken and reports made have been very gratifying.

Centers have been established, at which the river reports from special stations have been gathered in times of danger from flood, and rapidly disseminated through the sections of adjacent country liable to overflow, thus being the means of saving much valuable property and perhaps a number of lives.

My report on this subject explains the whole system of river and flood reports, and indicates how it has been extended and simplified during the year.

During the coming year it is expected that river gauges will be located, observers appointed, and observations commenced at many important points which the insufficient appropriations have heretofore prevented being done.

In the cotton-region system of reports, but few changes from last year have been made. Much pressure has been brought to bear on this office to open new stations at important points in the cotton-belt, but, as will be seen from my report on this subject, the meagerness of the appropriation for this branch of the service would not permit of any expenditures in this direction. On the contrary, observations were not begun until May 1 this year, in order that the money might be husbanded to operate this important service up to the end of the fiscal year, to avoid discontinuing any of the stations.

With a liberal sum from Congress for this work, the reports and their resulting advantages to all cotton interests could be extended indefinitely.

The cold-wave signal is a recent feature of this service; but one which at once made its way into public favor.

The first few warnings of approaching cold waves were received by the business community with such marked approval that this signal has become very popular, and all agricultural, commercial, and industrial interests are anxious to obtain the information of approaching cold weather.

My report on this signal shows what advancement has been made, and how the wants of the people for these reports have been met by the Signal Service; and also the gratifying results of the system.

With a limited appropriation for the purpose, much good could be accomplished, and many important centers of population furnished with cold-wave warnings which have of necessity been left untouched.

In my report on the railway weather bulletin service for the year, it will be seen that much good has been accomplished in the way of furnishing the weather predictions to the railroads of the country for transmission to, and display at, stations on their roads, in the interests of the traveling public and the resident population at the many hundreds of offices reached.

This railway service has been considerably extended during the year, so that fifty-one roads now post the daily weather reports at their various offices.

These reports are growing in favor, and are found to be very valuable in making shipments, moving freight, &c.

It is expected that during the ensuing year other roads will adopt this system, and that finally every railroad in the country will see the advantages to be derived from the weather forecasts furnished by this office.

Considerable has been done in the way of displaying weather and temperature signals from railroad trains. A number of roads have obtained flags or symbols, and are co-operating with this service in publishing the weather reports. On some roads the signals or symbols are displayed from the baggage-cars, and on others at the stations on the road. The indications are telegraphed to the superintendent, or other official charged with the work, and under his direction the proper symbols are displayed.

It is expected that a majority of the railroads of the country will rapidly adopt this system, which is so simple and inexpensive, the reports being sent from this office at the cost of the Signal Service.

In addition to the 49 regular appendices of the Annual Report of the Chief Signal Officer, meteorological data and tables have been compiled in the Stations Division, occupying time equal to the labor of one man for 966 working hours. These data have been for use in courts, for publication, for use of merchants' exchanges and boards of trade, for the Mississippi River Commission, for use of railroads, State boards of health, State weather services, and scientific purposes generally.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,

Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,
Washington City.

APPENDIX 5.

No. 5.—Mean normal pressure, corrected for temperature and instrumental error only, at stations of the Signal Service, United States Army, for each month and the year. (Compiled from January, 1880, to December, 1888, inclusive, except at stations opened subsequent to the former date, with monthly constants for the reduction to sea-level of barometric observations made at Signal-Service stations.)

[Obtained by dividing the sum of the 7 a. m., 3, and 11 p. m. (Washington time), normals by three.]

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England:														
Boston, Mass.	Apr. 1, 1873	29.975	29.978	29.807	29.858	29.816	29.844	29.815	29.811	29.992	29.988	29.970	29.916	29.908
Portland, Me.	Jan. 15, 1871	30.031	30.027	29.854	29.831	29.928	29.841	29.841	29.847	29.904	30.033	30.034	29.974	29.917
Mount Washington, N. H.	Dec. 1, 1870	29.432	29.435	29.366	29.493	29.736	29.818	29.833	29.827	29.888	29.767	29.854	23.457	23.647
Boston, Mass.	Nov. 1, 1870	29.975	29.972	29.790	29.776	29.863	29.823	29.794	29.885	29.933	29.877	29.975	29.918	29.891
Block Island, R. I.	Sept. 1, 1880	30.086	30.113	29.891	29.882	29.969	29.944	29.910	30.005	30.042	30.093	30.100	30.042	30.008
New Haven, Conn.	Dec. 10, 1872	30.018	30.019	29.837	29.822	29.888	29.853	29.830	29.925	29.954	30.005	30.020	29.967	29.928
New London, Conn.	Jan. 10, 1871	30.094	30.096	29.907	29.893	29.972	29.932	29.908	30.003	30.034	30.066	30.099	30.048	30.006
Middle Atlantic States:														
Albany, N. Y.	Dec. 22, 1873	30.064	30.052	29.886	29.856	29.904	29.870	29.846	29.944	29.982	30.038	30.052	30.011	29.939
New York City	Nov. 1, 1870	29.979	29.977	29.798	29.781	29.810	29.808	29.791	29.880	29.910	29.961	29.961	29.930	29.886
Philadelphia, Pa.	Jan. 1, 1871	30.051	30.015	29.870	29.848	29.896	29.864	29.850	29.934	29.966	30.022	30.057	30.008	29.931
Atlantic City, N. J.	Dec. 10, 1873	30.145	30.143	29.960	29.949	29.999	29.966	29.948	30.030	30.039	30.114	30.151	30.101	30.047
Barnegat City, N. J.	Dec. 10, 1873	30.130	30.131	29.949	29.937	29.988	29.953	29.933	30.019	30.047	30.102	30.135	30.086	30.084
Cape May, N. J.	May 24, 1871	30.126	30.121	29.944	29.930	29.974	29.943	29.936	30.014	30.011	30.096	30.136	30.087	30.028
Sandy Hook, N. J.	Dec. 10, 1873	30.125	30.125	29.943	29.930	29.982	29.948	29.920	30.016	30.047	30.104	30.152	30.107	30.050
Delaware Breakwater, Del.	Jan. 28, 1880	30.106	30.146	29.908	29.867	29.938	29.969	29.953	30.026	30.035	30.108	30.153	30.106	30.042
Baltimore, Md.	Jan. 1, 1871	30.146	30.139	29.971	29.954	29.946	29.950	29.938	30.011	30.042	30.105	30.164	30.106	30.042
Washington City	Nov. 1, 1870	30.077	30.067	29.905	29.885	29.915	29.964	29.939	30.030	30.062	30.130	30.168	30.128	29.976
Cape Henry, Va.	Dec. 15, 1873	30.156	30.163	29.989	29.974	30.012	29.976	29.974	30.025	30.061	30.119	30.165	30.127	30.062
Chincoteague, Va.	Mar. 10, 1880	30.156	30.160	29.973	29.975	30.011	29.977	29.971	30.034	30.061	30.119	30.165	30.127	30.061
Lynchburg, Va.	May 24, 1871	29.462	29.459	29.307	29.300	29.339	29.318	29.323	29.371	29.403	29.449	29.484	29.435	29.368
Norfolk, Va.	Jan. 1, 1871	30.146	30.151	29.975	29.961	30.003	29.968	29.967	30.014	30.048	30.103	30.153	30.117	30.050
South Atlantic States:														
Charleston, S. C.	Oct. 6, 1878	29.296	29.303	29.157	29.153	29.181	29.167	29.176	29.202	29.239	29.280	29.318	29.277	29.229
Hatteras, N. C.	Dec. 1, 1880	30.158	30.175	29.968	29.946	30.032	29.994	30.001	30.029	30.064	30.102	30.156	30.128	30.070
Kitty Hawk, N. C.	Jan. 15, 1875	30.183	30.192	30.021	30.013	30.051	30.017	30.014	30.055	30.088	30.130	30.180	30.144	30.091
Macon, Fort, N. C.	May 23, 1878	30.169	30.160	30.013	30.005	30.033	30.004	30.005	30.027	30.063	30.105	30.159	30.137	30.075
Smithville, N. C.	Oct. 15, 1875	30.145	30.165	30.004	30.001	30.010	30.002	30.004	30.007	30.043	30.086	30.143	30.125	30.060
Wilmington, N. C.	Jan. 1, 1871	30.128	30.134	29.972	29.958	29.985	29.959	29.964	29.985	30.019	30.068	30.121	30.098	30.032
Charleston, S. C.	Jan. 5, 1871	30.124	30.134	29.991	29.970	29.987	29.968	29.971	29.980	30.010	30.032	30.021	30.099	30.034
Augusta, Ga.	Nov. 2, 1870	30.020	30.018	29.880	29.855	29.885	29.861	29.850	29.860	29.908	29.956	30.011	29.980	29.923
Savannah, Ga.	Jan. 1, 1871	30.098	30.108	29.873	29.847	29.961	29.944	29.950	29.949	29.978	30.019	30.086	30.073	30.008
Jacksonville, Fla.	Sept. 11, 1871	30.143	30.146	30.036	29.965	29.993	29.966	30.013	29.990	30.009	30.036	30.110	30.114	30.048

No. 5.—Mean normal pressure, corrected for temperature and instrumental error only, at stations of the Signal Service, &c.—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Florida Peninsula:														
Cedar Keys, Fla.....	Nov. 7, 1879	30.155	30.154	30.075	30.033	30.007	30.019	30.046	30.005	30.017	30.018	30.114	30.128	30.068
Key West, Fla.....	Nov. 1, 1870	30.115	30.134	30.075	30.043	30.023	30.023	30.038	30.022	30.077	30.076	30.046	30.093	30.043
Sanford, Fla.....	Sept. 1, 1882	30.155	30.068	30.031	30.030	29.958	29.982	29.991	29.966	29.981	29.994	30.048	30.094	30.014
Eastern Gulf States:														
Atlanta, Ga.....	Sept. 25, 1878	29.962	29.980	29.868	29.854	29.877	29.876	29.805	29.907	29.926	29.958	29.908	29.965	29.924
Pensacola, Fla.....	Oct. 27, 1879	30.154	30.144	30.062	30.000	29.950	29.980	30.022	29.989	30.010	30.045	30.130	30.124	30.055
Mobile, Ala.....	Nov. 7, 1870	30.140	30.127	30.030	29.996	29.958	29.957	30.020	29.986	30.003	30.039	30.140	30.119	30.043
Montgomery, Ala.....	Nov. 9, 1870	29.953	29.941	29.897	29.797	29.801	29.788	29.813	29.800	29.830	29.870	29.953	29.931	29.849
Vicksburg, Miss.....	Sept. 10, 1871	29.970	29.892	29.805	29.759	29.754	29.761	29.800	29.780	29.803	29.838	29.932	29.902	29.829
New Orleans, La.....	Nov. 1, 1870	30.060	30.063	30.002	29.553	29.941	29.945	29.986	29.951	29.966	29.998	30.037	30.079	30.068
Western Gulf States:														
Slidestown, La.....	Sept. 3, 1871	29.927	29.985	29.807	29.743	29.740	29.755	29.793	29.784	29.807	29.834	29.933	29.905	29.826
Fort Smith, Ark.....	June 1, 1882	29.736	29.682	29.550	29.448	29.483	29.487	29.527	29.560	29.561	29.583	29.680	29.620	29.576
Little Rock, Ark.....	July 1, 1879	29.842	29.805	29.715	29.654	29.658	29.655	29.700	29.702	29.728	29.757	29.857	29.827	29.742
Galveston, Tex.....	Aug. 19, 1871	30.104	30.079	30.000	29.941	29.927	29.942	29.990	29.963	29.969	30.003	30.096	30.062	30.008
Indianola, Tex.....	May 1, 1872	30.119	30.074	29.997	29.935	29.923	29.938	29.991	29.965	29.969	30.008	30.107	30.096	30.010
Palestine, Tex.....	Dec. 3, 1881	29.668	29.581	29.506	29.417	29.441	29.453	29.497	29.562	29.503	29.510	29.607	29.565	29.521
Rio Grande Valley:														
Brownsville, Tex.....	Aug. 25, 1875	30.072	30.032	29.942	29.873	29.866	29.880	29.939	29.915	29.917	29.946	30.080	30.042	29.837
Rio Grande City, Tex.....	May 28, 1875	29.914	29.847	29.782	29.719	29.684	29.731	29.758	29.747	29.760	29.826	29.927	29.904	29.800
Ohio Valley and Tennessee:														
Chattanooga, Tenn.....	Jan. 8, 1879	29.855	29.844	29.298	29.203	29.224	29.217	29.240	29.247	29.277	29.314	29.373	29.339	29.280
Knoxville, Tenn.....	Jan. 1, 1871	29.136	29.128	29.713	29.895	29.022	29.018	29.045	29.055	29.046	29.117	29.195	29.125	29.076
Memphis, Tenn.....	Feb. 28, 1871	29.631	29.601	29.703	29.650	29.652	29.650	29.701	29.697	29.708	29.760	29.845	29.812	29.786
Nashville, Tenn.....	Nov. 1, 1870	29.881	29.853	29.451	29.414	29.420	29.409	29.454	29.448	29.483	29.524	29.584	29.563	29.492
Louisville, Ky.....	Sept. 11, 1870	29.556	29.536	29.453	29.402	29.419	29.403	29.442	29.457	29.487	29.523	29.582	29.560	29.482
Indianapolis, Ind.....	Feb. 10, 1871	29.286	29.274	29.182	29.157	29.177	29.181	29.206	29.237	29.259	29.285	29.320	29.291	29.237
Cincinnati, Ohio.....	Nov. 1, 1870	29.493	29.446	29.358	29.341	29.358	29.340	29.374	29.402	29.429	29.464	29.516	29.478	29.417
Columbus, Ohio.....	July 1, 1878	29.232	29.245	29.137	29.117	29.146	29.158	29.189	29.188	29.224	29.255	29.343	29.300	29.200
Pittsburg, Pa.....	Nov. 1, 1870	29.302	29.285	29.173	29.156	29.168	29.174	29.193	29.205	29.275	29.305	29.328	29.283	29.243
Lower Lakes:														
Buffalo, N. Y.....	Nov. 1, 1870	29.228	29.323	29.217	29.206	29.237	29.219	29.218	29.291	29.317	29.348	29.328	29.281	29.276
Oswego, N. Y.....	Nov. 1, 1870	29.744	29.737	29.614	29.594	29.627	29.609	29.578	29.671	29.689	29.740	29.733	29.694	29.699
Rochester, N. Y.....	Nov. 1, 1870	29.410	29.410	29.303	29.284	29.319	29.304	29.274	29.358	29.380	29.428	29.438	29.387	29.358
Erie, Pa.....	May 25, 1873	29.359	29.362	29.244	29.237	29.264	29.244	29.253	29.312	29.335	29.361	29.364	29.326	29.304
Cleveland, Ohio.....	Nov. 1, 1870	29.362	29.250	29.239	29.239	29.241	29.241	29.202	29.317	29.338	29.365	29.378	29.342	29.308
Cleveland, Ohio.....	Aug. 2, 1877	29.419	29.402	29.308	29.289	29.321	29.305	29.308	29.303	29.381	29.414	29.459	29.429	29.368
Toledo, Ohio.....	Nov. 1, 1870	29.392	29.375	29.286	29.280	29.294	29.283	29.284	29.337	29.356	29.401	29.452	29.429	29.363
Detroit, Mich.....	Nov. 1, 1870	29.873	29.863	29.277	29.263	29.274	29.254	29.275	29.834	29.850	29.879	29.882	29.851	29.823

REPORT OF THE CHIEF SIGNAL OFFICER.

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Upper Lobe:

Upper Lakes.		Sept. 10, 1872		20, 371		29, 376		29, 316		29, 321		30, 270		29, 291		29, 363		29, 365		29, 392		29, 393		29, 344	
Alpena, Mich.	May 24, 1871	29, 306	29, 376	29, 336	29, 382	29, 316	29, 380	29, 321	29, 370	29, 281	29, 363	29, 365	29, 392	29, 393	29, 344	29, 387	29, 343	29, 347	29, 347	29, 347	29, 347	29, 347	29, 347	29, 347	29, 347
Ashtabula, Mich.	May 24, 1871	29, 306	29, 376	29, 336	29, 382	29, 316	29, 380	29, 321	29, 370	29, 281	29, 363	29, 365	29, 392	29, 393	29, 344	29, 387	29, 343	29, 347	29, 347	29, 347	29, 347	29, 347	29, 347	29, 347	
Grand Haven, Mich.	Aug. 20, 1882	29, 309	29, 377	29, 319	29, 319	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	29, 306	
Marquette, Mich.	July 1, 1871	29, 301	29, 301	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	29, 270	
Port Huron, Mich.	July 25, 1874	29, 383	29, 371	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	29, 293	
Chicago, Ill.	Nov. 1, 1870	29, 374	29, 356	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	
Milwaukee, Wis.	Nov. 1, 1870	29, 374	29, 356	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	29, 285	
Duluth, Minn.	Nov. 1, 1870	29, 331	29, 312	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	29, 292	
Upper Mississippi Valley:																									
Saint Paul, Minn.	Nov. 1, 1870	29, 185	29, 169	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	29, 136	
La Crosse, Wis.	Oct. 15, 1872	29, 200	29, 271	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	29, 225	
Davenport, Iowa	May 24, 1871	29, 452	29, 417	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	29, 362	
Des Moines, Iowa	Aug. 1, 1878	29, 121	29, 179	29																					

No. 5.—Mean normal pressure, corrected for temperature and instrumental error only, at stations of the Signal Service, &c.—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Southern Plateau:														
El Paso, Tex.....	Nov. 5, 1877	26.200	26.201	26.221	26.192	26.100	26.186	26.249	26.205	26.270	26.262	26.321	26.303	26.248
Apache, Fort, Ariz.....	Oct. 9, 1877	25.026	25.009	24.994	24.972	24.960	25.005	25.067	25.073	25.035	25.081	25.058	25.045	25.026
Grant, Fort, Ariz.....	Nov. 1, 1875	25.238	25.216	25.179	25.167	25.164	25.203	25.245	25.241	25.257	25.234	25.238	25.238	25.219
Prescott, Ariz.....	Nov. 10, 1873	24.717	24.703	24.672	24.659	24.660	24.714	24.793	24.785	24.758	24.730	24.755	24.728	24.724
Thomas, Camp, Ariz.....	Sept. 22, 1877	27.307	27.271	27.228	27.163	27.138	27.134	27.192	27.184	27.192	27.221	27.287	27.302	27.219
Yuma, Ariz.....	Nov. 18, 1873	29.839	29.913	29.827	29.760	29.673	29.623	29.653	29.647	29.604	29.754	29.863	29.876	29.766
Middle Plateau:														
Winemucca, Nev. ¹	July 1, 1877	25.044	25.613	25.598	25.528	25.552	25.540	25.608	25.573	25.608	25.627	25.728	25.642	25.607
Salt Lake City, Utah.....	Mar. 10, 1874	25.085	25.665	25.612	25.552	25.579	25.576	25.644	25.641	25.639	25.653	25.718	25.673	25.640
Northern Plateau:														
Boise City, Idaho.....	July 1, 1877	27.282	27.243	27.180	27.114	27.130	27.106	27.156	27.134	27.174	27.214	27.243	27.250	27.194
Levison, Idaho.....	July 1, 1879	29.330	29.307	29.201	29.136	29.157	29.096	29.141	29.130	29.100	29.215	29.380	29.283	29.313
Dayton, Wash.....	July 1, 1879	28.883	28.335	28.273	28.223	28.247	28.304	28.256	28.253	28.257	28.241	28.394	28.336	28.324
Spokane, Walla, Wash.....	Feb. 5, 1881	28.076	28.029	27.974	27.919	27.932	27.908	27.967	27.964	27.935	27.934	28.080	28.032	27.864
North Pacific Coast:														
Croby, Fort, Wash.....	Sept. 1, 1883	29.890	29.823	29.731	29.744	29.835	29.772	29.856	29.816	29.799	29.827	29.875	29.803	29.818
Olympia, Wash.....	July 1, 1877	30.040	30.047	29.999	29.941	30.018	30.079	30.028	29.998	30.009	29.965	30.111	29.990	30.010
Tatoosh Island, Wash.....	Oct. 1, 1883	28.958	29.917	29.810	28.828	29.859	29.875	29.862	29.862	28.874	29.868	29.842	28.816	28.894
Portland, Oreg.....	Nov. 1, 1871	30.616	30.650	30.583	30.521	30.561	30.490	30.561	30.561	30.560	30.560	30.104	29.803	29.901
Roseburg, Oreg.....	July 15, 1877	28.582	28.572	28.506	28.459	28.501	28.477	28.509	28.451	28.483	28.521	28.626	28.494	28.519
Middle Pacific Coast:														
Cape Mendocino, Cal.....	July 27, 1882	28.458	28.346	28.290	28.315	28.315	28.323	28.306	28.303	28.302	28.331	28.368	28.278	28.324
Red Bluff, Cal.....	July 1, 1877	30.097	30.068	29.977	29.933	29.969	29.939	29.953	29.917	29.956	29.951	29.763	28.729	28.646
Sacramento, Cal.....	July 1, 1877	30.077	30.060	29.975	29.940	29.863	29.843	29.833	29.833	29.835	29.835	29.854	29.843	29.844
San Francisco, Cal.....	Mar. 8, 1871	30.097	30.060	29.996	29.964	29.944	29.913	29.916	29.891	29.897	29.906	30.062	30.036	29.951
South Pacific Coast:														
Los Angeles, Cal.....	July 1, 1877	29.735	29.729	29.686	29.661	29.601	29.571	29.568	29.590	29.568	29.611	29.686	29.695	29.641
San Diego, Cal.....	Nov. 1, 1877	30.031	30.040	29.993	29.960	29.898	29.867	29.887	29.847	29.848	29.902	29.973	29.964	29.905

¹ Observations discontinued June 15, 1883, and recommenced December 1, 1884.

Monthly constants for the reduction to sea-level of barometric observations made at Signal Service stations.

[The column headed "Altitude" contains the elevation above sea-level of the barometers at the several stations as adopted by this office. The letter B denotes that the altitude has been obtained from barometric readings. The values given in this column will be used on all forms instead of values heretofore in use.]

Station.	Altitude.	Reduction constant for each month.											
		Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Albany, N. Y.	33	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10
Alexander, Fort, Alaska.	38	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05
Alpena, Mich.	609 B	0.71	0.71	0.70	0.69	0.68	0.65	0.64	0.64	0.65	0.67	0.70	0.71
Apache, Fort, Ariz.	5050 B	8.12	5.10	5.02	4.92	4.82	4.75	4.74	4.72	4.80	4.90	5.10	5.08
Ashland, Fort, Mont.	2720 B	3.05	3.05	3.02	2.91	2.85	2.80	2.74	2.76	2.86	2.93	2.99	3.04
Atlanta, Ga.	1129	1.23	1.22	1.21	1.19	1.17	1.15	1.15	1.15	1.17	1.19	1.22	1.23
Atlantic City, N. J.	13	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Augusta, Ga.	183	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.20
Baltimore, Md.	45	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Barnegat City, N. J.	22	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Behring's Island, Behring Sea	22	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Bennett, Fort, Dak.	1510 B	1.74	1.73	1.70	1.64	1.56	1.54	1.54	1.54	1.59	1.62	1.69	1.75
Benton, Fort, Mont.	2381 B	2.97	2.99	2.97	2.85	2.78	2.76	2.70	2.78	2.83	2.90	2.95	2.99
Bismarck, Dak.	1694	2.00	1.98	1.92	1.88	1.79	1.76	1.73	1.76	1.80	1.88	1.98	2.03
Block Island, R. I.	27	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Boise City, Idaho.	2750 B	2.93	2.96	2.92	2.84	2.84	2.78	2.72	2.75	2.77	2.86	2.94	2.96
Boston, Mass.	122	0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.14	0.14	0.14
Brownsville, Tex.	57	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Buffalo, N. Y.	690	0.79	0.79	0.78	0.77	0.74	0.73	0.72	0.72	0.73	0.75	0.77	0.79
Buford, Fort, Dak.	1930 B	2.23	2.21	2.16	2.10	2.00	1.99	1.96	1.98	2.02	2.10	2.16	2.27
Cairo, Ill.	377	0.42	0.42	0.42	0.41	0.40	0.39	0.39	0.39	0.40	0.40	0.42	0.42
Canby, Fort, Wash.	179	0.20	0.20	0.20	0.20	0.20	0.19	0.19	0.19	0.20	0.20	0.20	0.20
Cape Henry, Va.	17	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Cape May, N. J.	27	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Cape Mendocino, Cal.	637	0.70	0.70	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.69	0.70	0.70
Cedar Keys, Fla.	22	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Charleston, S. C.	52	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06
Charlotte, N. C.	808	0.89	0.89	0.88	0.86	0.84	0.83	0.83	0.83	0.84	0.86	0.88	0.89
Chattanooga, Tenn.	753	0.86	0.86	0.85	0.85	0.85	0.81	0.81	0.80	0.80	0.81	0.83	0.85
Cheyenne, Wyo.	6105	6.27	6.27	6.20	6.02	5.99	5.76	5.71	5.72	5.88	6.04	6.23	6.30
Chicago, Ill.	601	0.75	0.75	0.74	0.73	0.70	0.69	0.69	0.69	0.69	0.71	0.74	0.76
Chimney, Va.	8	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cincinnati, Ohio.	620	0.69	0.69	0.69	0.67	0.65	0.65	0.64	0.64	0.65	0.66	0.69	0.70
Cleveland, Ohio.	690	0.78	0.79	0.78	0.76	0.73	0.73	0.72	0.72	0.72	0.74	0.77	0.79
Coleman City, Tex.	1709	1.88	1.88	1.85	1.82	1.79	1.75	1.76	1.74	1.79	1.82	1.89	1.90
Columbus, Ohio.	805	0.90	0.90	0.89	0.87	0.84	0.84	0.83	0.83	0.84	0.86	0.89	0.91
Concho, Fort, Tex.	1900 B	2.02	2.02	1.97	1.94	1.90	1.87	1.88	1.89	1.90	1.95	2.01	2.02
Custer, Fort, Mont.	3040 B	3.38	3.36	3.33	3.18	3.10	3.06	3.02	3.06	3.12	3.24	3.32	3.40
Davenport, Iowa.	615	0.71	0.70	0.69	0.67	0.64	0.64	0.63	0.63	0.65	0.66	0.69	0.71
Davis, Fort, Tex.	4928 B	4.97	4.95	4.87	4.78	4.71	4.60	4.63	4.64	4.69	4.84	4.99	4.93
Dayton, Wash.	1667 B	1.81	1.82	1.82	1.76	1.76	1.75	1.72	1.72	1.75	1.79	1.79	1.84
Deadwood, Dak.	4600 B	4.95	4.92	4.84	4.69	4.52	4.44	4.43	4.44	4.56	4.68	4.84	4.99
Delaware Breakwater, Del.	20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Denver, Colo.	5294	5.52	5.53	5.44	5.27	5.16	5.04	5.01	5.02	5.11	5.26	5.50	5.53
Des Moines, Iowa.	849	0.97	0.97	0.96	0.93	0.89	0.88	0.88	0.88	0.89	0.92	0.95	0.96
Detroit, Mich.	661	0.76	0.75	0.75	0.73	0.70	0.69	0.69	0.69	0.69	0.71	0.74	0.76
Dodge City, Kans.	2517	2.75	2.74	2.73	2.64	2.55	2.51	2.50	2.48	2.55	2.63	2.74	2.80
Dubuque, Iowa.	665	0.77	0.76	0.75	0.73	0.70	0.69	0.69	0.69	0.70	0.72	0.75	0.77
Duluth, Minn.	672	0.79	0.79	0.77	0.75	0.73	0.71	0.70	0.70	0.72	0.74	0.77	0.80
Eastport, Me.	61	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.07	0.07
Elliot, Fort, Tex.	2650 B	2.93	2.90	2.83	2.78	2.70	2.67	2.64	2.64	2.69	2.79	2.93	2.96
El Paso, Tex.	3764 B	3.88	3.88	3.80	3.74	3.64	3.59	3.60	3.60	3.65	3.74	3.85	3.86
Eric, Pa.	681	0.77	0.77	0.77	0.75	0.72	0.72	0.71	0.71	0.71	0.73	0.76	0.77
Escanaba, Mich.	613	0.72	0.72	0.71	0.69	0.66	0.65	0.64	0.64	0.66	0.67	0.70	0.72
Fort Smith, Ark.	451	0.50	0.50	0.49	0.48	0.47	0.46	0.46	0.46	0.47	0.48	0.49	0.50
Galveston, Tex.	40	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Grand Haven, Mich.	620	0.71	0.71	0.70	0.69	0.66	0.65	0.65	0.65	0.66	0.67	0.70	0.71
Grant, Fort, Ariz.	4856 B	4.90	4.86	4.83	4.73	4.61	4.54	4.57	4.57	4.60	4.70	4.84	4.88
Hatteras, N. C.	12	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Helena, Mont.	4044 B	4.38	4.35	4.32	4.21	4.13	4.07	4.01	4.04	4.12	4.25	4.33	4.33
Huron, Dak.	1305	1.54	1.52	1.48	1.45	1.35	1.34	1.32	1.34	1.38	1.43	1.48	1.54
Indianapolis, Ind.	753	0.84	0.85	0.84	0.82	0.79	0.78	0.77	0.77	0.78	0.80	0.84	0.85
Indianola, Tex.	29	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Jacksonville, Fla.	43	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05
Keokuk, Iowa.	618	0.70	0.70	0.69	0.67	0.65	0.64	0.63	0.63	0.65	0.67	0.69	0.71
Key West, Fla.	9	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Kitty Hawk, N. C.	9	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Knoxville, Tenn.	980	1.08	1.08	1.06	1.04	1.02	1.01	1.00	1.01	1.02	1.04	1.07	1.06
La Crosse, Wis.	725	0.84	0.84	0.82	0.80	0.76	0.76	0.75	0.75	0.77	0.79	0.82	0.85
Leavenworth, Kans.	842	0.86	0.85	0.84	0.81	0.78	0.77	0.76	0.76	0.77	0.79	0.82	0.85
Lewiston, Idaho.	780 B	0.87	0.87	0.86	0.85	0.84	0.82	0.81	0.81	0.83	0.85	0.87	0.88

Monthly constants for the reduction to sea-level of barometric observations, &c.—Continued.

Station.	Altitude.	Reduction constant for each month.											
		Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Little Rock, Ark.	299	0.33	0.33	0.33	0.32	0.31	0.31	0.31	0.31	0.31	0.32	0.33	0.33
Los Angeles, Cal.	871	0.40	0.40	0.40	0.40	0.40	0.39	0.39	0.39	0.39	0.40	0.40	0.40
Louisville, Ky.	530	0.50	0.50	0.50	0.50	0.55	0.55	0.55	0.55	0.55	0.57	0.59	0.60
Lynchburg, Va.	652	0.72	0.72	0.72	0.71	0.68	0.67	0.67	0.67	0.68	0.69	0.72	0.73
Macinauw City, Mich.	605	0.70	0.70	0.70	0.68	0.65	0.64	0.64	0.64	0.65	0.67	0.69	0.70
Macon, Fort. N. C.	11	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Maginnis, Fort, Mont.	4340 B	4.77	4.75	4.60	4.50	4.41	4.33	4.31	4.31	4.40	4.54	4.60	4.63
Marquette, Mich.	673	0.78	0.78	0.77	0.75	0.72	0.72	0.71	0.71	0.72	0.74	0.77	0.78
Memphis, Tenn.	321	0.36	0.35	0.35	0.34	0.33	0.32	0.33	0.33	0.34	0.34	0.35	0.36
Milwaukee, Wis.	697	0.80	0.80	0.79	0.77	0.74	0.74	0.73	0.73	0.74	0.76	0.79	0.81
Mobile, Ala.	85	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Montgomery, Ala.	919	0.24	0.24	0.24	0.23	0.23	0.23	0.22	0.23	0.23	0.23	0.24	0.24
Moorhead, Minn.	223	1.11	1.10	1.08	1.03	0.98	0.97	0.96	0.97	0.99	1.02	1.06	1.11
Mount Washington, N. H.	6279	6.63	6.62	6.52	6.41	6.18	6.12	6.07	6.08	6.15	6.34	6.56	6.63
Myer, Fort, Va.	267	0.30	0.30	0.30	0.29	0.28	0.28	0.28	0.28	0.28	0.29	0.30	0.30
Nashville, Tenn.	549	0.61	0.61	0.60	0.58	0.57	0.56	0.56	0.56	0.57	0.58	0.60	0.61
New Haven, Conn.	107	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.12	0.12	0.12
New London, Conn.	47	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
New Orleans, La.	52	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06
New York City, La.	164	0.19	0.19	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.18	0.18	0.19
Norfolk, Va.	30	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
North Platte, Nebr.	2841	3.12	3.10	3.06	2.96	2.87	2.80	2.80	2.80	2.88	2.96	3.04	3.16
Olympia, Wash.	36	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Omaha, Nebr.	1113	1.27	1.27	1.25	1.21	1.16	1.14	1.13	1.14	1.17	1.20	1.24	1.29
Oswego, N. Y.	334	0.38	0.38	0.37	0.37	0.36	0.35	0.35	0.35	0.35	0.36	0.37	0.38
Pasadena, Tex.	533	0.58	0.58	0.57	0.56	0.55	0.54	0.54	0.54	0.54	0.56	0.57	0.58
Pensacola, Fla.	30	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Philadelphia, Pa.	117	0.18	0.18	0.18	0.13	0.13	0.12	0.12	0.12	0.12	0.13	0.13	0.13
Pike's Peak, Colo.	14134	12.70	12.72	12.59	12.28	12.06	11.82	11.78	11.79	11.96	12.28	12.66	12.66
Pittsburg, Mo.	766	0.85	0.86	0									

APPENDIX 6.

Mean of the highest pressure (reduced to sea-level) at stations of the Signal Service, United States Army, for each month of the year. (Compiled from the commencement of observations at each station, to and including December, 1884.)

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
New England:	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Eastport, Me.	30.61	30.66	30.52	30.38	30.41	30.31	30.22	30.29	30.44	30.48	30.58	30.62
Portland, Me.	30.60	30.67	30.54	30.39	30.41	30.32	30.23	30.30	30.44	30.50	30.58	30.64
Mount Washington, N. H.	30.40	30.36	30.32	30.32	30.41	30.43	30.38	30.44	30.47	30.45	30.44	30.41
Boston, Mass.	30.67	30.06	30.55	30.40	30.42	30.33	30.24	30.32	30.43	30.53	30.60	30.65
Block Island, R. I.	30.70	30.79	30.50	30.41	30.44	30.40	30.24	30.34	30.40	30.52	30.57	30.58
New Haven, Conn.	30.68	30.66	30.55	30.41	30.41	30.32	30.25	30.31	30.41	30.53	30.60	30.65
New London, Conn.	30.68	30.69	30.56	30.42	30.44	30.34	30.26	30.38	30.43	30.54	30.61	30.65
Middle Atlantic States:												
Albany, N. Y.	30.71	30.73	30.53	30.42	30.39	30.29	30.23	30.30	30.42	30.52	30.60	30.68
New York City.	30.69	30.70	30.55	30.42	30.41	30.32	30.25	30.31	30.40	30.54	30.62	30.65
Philadelphia, Pa.	30.70	30.70	30.55	30.42	30.41	30.32	30.25	30.30	30.40	30.54	30.62	30.65
Atlantic City, N. J.	30.68	30.69	30.53	30.42	30.39	30.30	30.23	30.28	30.37	30.52	30.59	30.61
Barnegat City, N. J.	30.68	30.68	30.53	30.42	30.39	30.30	30.22	30.27	30.37	30.51	30.59	30.60
Cape May, N. J.	30.67	30.66	30.54	30.39	30.38	30.29	30.24	30.27	30.37	30.51	30.58	30.62
Sandy Hook, N. J.	30.69	30.70	30.53	30.42	30.41	30.31	30.23	30.29	30.40	30.52	30.60	30.63
Delaware Break water, Del.	30.77	30.74	30.54	30.39	30.39	30.32	30.23	30.38	30.37	30.52	30.62	30.60
Baltimore, Md.	30.70	30.71	30.56	30.42	30.41	30.32	30.25	30.29	30.39	30.54	30.63	30.65
Washington City	30.69	30.70	30.56	30.41	30.41	30.31	30.24	30.29	30.38	30.55	30.62	30.66
Cape Henry, Va.	30.60	30.65	30.52	30.40	30.36	30.28	30.24	30.26	30.34	30.49	30.56	30.59
Chincoteague, Va.	30.76	30.74	30.50	30.39	30.38	30.32	30.22	30.32	30.35	30.51	30.61	30.58
Lynchburg, Va.	30.68	30.66	30.54	30.39	30.37	30.29	30.24	30.26	30.37	30.53	30.60	30.63
Norfolk, Va.	30.66	30.65	30.55	30.40	30.37	30.30	30.26	30.26	30.35	30.50	30.57	30.61
South Atlantic States:												
Charlottesville, N. C.	30.61	30.61	30.48	30.34	30.32	30.25	30.22	30.26	30.33	30.51	30.56	30.56
Hatteras, N. C.	30.60	30.64	30.46	30.37	30.34	30.26	30.23	30.24	30.30	30.46	30.52	30.52
Kitty Hawk, N. C.	30.65	30.68	30.54	30.40	30.36	30.29	30.26	30.26	30.34	30.48	30.53	30.57
Macon, Fort, N. C.	30.68	30.62	30.45	30.36	30.31	30.24	30.24	30.24	30.30	30.42	30.53	30.55
Smithville, N. C.	30.60	30.59	30.51	30.39	30.33	30.27	30.25	30.26	30.30	30.45	30.50	30.54
Wilmington, N. C.	30.61	30.58	30.52	30.38	30.32	30.27	30.25	30.25	30.30	30.46	30.51	30.56
Charleston, S. C.	30.60	30.52	30.50	30.37	30.30	30.24	30.25	30.23	30.26	30.42	30.48	30.53
Augusta, Ga.	30.62	30.57	30.52	30.37	30.31	30.27	30.26	30.26	30.31	30.46	30.54	30.58
Savannah, Ga.	30.58	30.51	30.50	30.36	30.29	30.24	30.25	30.23	30.26	30.40	30.48	30.50
Jacksonville, Fla.	30.52	30.45	30.44	30.33	30.28	30.21	30.23	30.21	30.20	30.33	30.40	30.46
Florida Peninsula:												
Cedar Keys, Fla.	30.51	30.44	30.37	30.31	30.24	30.19	30.21	30.20	30.21	30.30	30.38	30.41
Key West, Fla.	30.35	33.30	30.31	30.22	30.14	30.16	30.17	30.13	30.12	30.17	30.23	30.30
Sanford, Fla.	30.52	30.31	30.34	30.18	30.20	30.12	30.18	30.17	30.18	30.24	30.26	30.20
Eastern Gulf States:												
Atlanta, Ga.	30.57	30.51	30.46	30.36	30.29	30.23	30.23	30.24	30.30	30.44	30.52	30.54
Pensacola, Fla.	30.58	30.49	30.41	30.33	30.26	30.20	30.20	30.19	30.21	30.34	30.50	30.50
Mobile, Ala.	30.58	30.48	30.44	30.32	30.25	30.20	30.22	30.19	30.20	30.30	30.46	30.51
Montgomery, Ala.	30.61	30.52	30.47	30.33	30.26	30.22	30.22	30.21	30.24	30.39	30.49	30.53
Vicksburg, Miss.	30.68	30.56	30.47	30.34	30.26	30.20	30.22	30.20	30.26	30.43	30.56	30.60
New Orleans, La.	30.57	30.48	30.42	30.29	30.22	30.17	30.19	30.16	30.18	30.35	30.47	30.51
Western Gulf States:												
Shreveport, La.	30.65	30.54	30.46	30.32	30.23	30.18	30.19	30.17	30.24	30.40	30.54	30.60
Fort Smith, Ark.	30.75	30.63	30.54	30.30	30.22	30.18	30.21	30.21	30.25	30.41	30.60	30.71
Little Rock, Ark.	30.68	30.61	30.49	30.34	30.27	30.19	30.20	30.19	30.27	30.42	30.65	30.69
Galveston, Tex.	30.59	30.50	30.40	30.30	30.20	30.15	30.17	30.15	30.19	30.36	30.50	30.52
Indianola, Tex.	30.59	30.52	30.42	30.33	30.20	30.17	30.17	30.15	30.20	30.36	30.55	30.57
Palestine, Tex.	30.72	30.55	30.51	30.33	30.24	30.18	30.21	30.18	30.26	30.44	30.62	30.65
Rio Grande Valley:												
Brownsville, Tex.	30.50	30.42	30.32	30.27	30.15	30.08	30.09	30.06	30.11	30.25	30.46	30.54
Rio Grande City, Tex.	30.60	30.49	30.40	30.30	30.18	30.10	30.09	30.09	30.17	30.35	30.56	30.59
Ohio Valley and Tennessee:												
see:												
Chattanooga, Tenn.	30.62	30.57	30.48	30.38	30.30	30.26	30.24	30.24	30.30	30.46	30.60	30.58
Knoxville, Tenn.	30.65	30.58	30.50	30.35	30.30	30.24	30.24	30.25	30.30	30.47	30.55	30.58
Memphis, Tenn.	30.72	30.59	30.50	30.32	30.25	30.19	30.20	30.19	30.28	30.44	30.57	30.62
Nashville, Tenn.	30.68	30.58	30.50	30.32	30.28	30.21	30.20	30.21	30.27	30.44	30.57	30.60
Louisville, Ky.	30.66	30.61	30.48	30.29	30.28	30.20	30.20	30.20	30.30	30.44	30.55	30.59
Indianapolis, Ind.	30.64	30.62	30.48	30.30	30.31	30.20	30.20	30.21	30.32	30.45	30.56	30.59

Mean of the highest pressure (reduced to sea-level) at stations of the Signal Service,
 &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Ohio Valley and Tennessee—Continued.	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Cincinnati, Ohio.....	30.68	30.64	30.50	30.34	30.33	30.22	30.21	30.22	30.33	30.47	30.58	30.61
Columbus, Ohio.....	30.66	30.62	30.48	30.34	30.34	30.26	30.19	30.22	30.37	30.50	30.61	30.62
Pittsburg, Pa.....	30.64	30.64	30.51	30.36	30.34	30.26	30.21	30.24	30.36	30.48	30.57	30.58
Lower Lakes:												
Buffalo, N. Y.....	30.64	30.67	30.51	30.39	30.35	30.26	30.20	30.26	30.38	30.48	30.56	30.61
Oswego, N. Y.....	30.68	30.70	30.54	30.39	30.38	30.29	30.22	30.29	30.41	30.51	30.59	30.65
Rochester, N. Y.....	30.67	30.69	30.53	30.40	30.36	30.26	30.21	30.26	30.39	30.50	30.59	30.62
Erie, Pa.....	30.65	30.65	30.49	30.40	30.35	30.26	30.19	30.25	30.36	30.45	30.55	30.57
Cleveland, Ohio.....	30.62	30.65	30.51	30.39	30.36	30.27	30.21	30.25	30.36	30.48	30.56	30.59
Sandusky, Ohio.....	30.64	30.63	30.50	30.36	30.38	30.27	30.20	30.23	30.38	30.48	30.56	30.60
Toledo, Ohio.....	30.61	30.62	30.50	30.37	30.36	30.24	30.20	30.23	30.35	30.46	30.56	30.59
Detroit, Mich.....	30.63	30.64	30.51	30.39	30.38	30.26	30.21	30.25	30.36	30.46	30.57	30.58
Upper Lakes:												
Alpena, Mich.....	30.62	30.66	30.54	30.45	30.40	30.26	30.22	30.27	30.40	30.47	30.57	30.55
Escanaba, Mich.....	30.63	30.65	30.56	30.43	30.41	30.27	30.23	30.25	30.41	30.46	30.59	30.57
Grand Haven, Mich.....	30.59	30.62	30.51	30.37	30.37	30.25	30.21	30.25	30.37	30.46	30.54	30.57
Mackinaw City, Mich.....	30.68	30.66	30.52	30.46	30.30	30.42	30.18	30.36	30.53	30.56	30.54	30.52
Marquette, Mich.....	30.61	30.68	30.55	30.44	30.35	30.27	30.24	30.26	30.41	30.47	30.57	30.53
Port Huron, Mich.....	30.62	30.66	30.48	30.39	30.39	30.24	30.21	30.24	30.37	30.46	30.55	30.56
Chicago, Ill.....	30.62	30.63	30.52	30.34	30.36	30.28	30.21	30.29	30.33	30.47	30.56	30.59
Milwaukee, Wis.....	30.64	30.65	30.54	30.38	30.39	30.26	30.24	30.26	30.38	30.49	30.59	30.61
Duluth, Minn.....	30.60	30.75	30.61	30.44	30.36	30.24	30.22	30.24	30.38	30.50	30.67	30.63
Upper Mississippi Valley:												
Saint Paul, Minn.....	30.67	30.70	30.56	30.36	30.31	30.16	30.18	30.21	30.35	30.46	30.63	30.62
La Crosse, Wis.....	30.68	30.71	0.56	30.36	30.36	30.20	30.23	30.24	30.37	30.50	30.62	30.64
Davenport, Iowa.....	30.70	30.69	30.53	30.33	30.35	30.21	30.23	30.25	30.37	30.49	30.62	30.64
Des Moines, Iowa.....	30.72	30.65	30.58	30.39	30.34	30.20	30.23	30.29	30.38	30.52	30.64	30.70
Dubuque, Iowa.....	30.68	30.68	30.52	30.36	30.34	30.19	30.23	30.25	30.37	30.50	30.62	30.64
Keokuk, Iowa.....	30.60	30.64	30.51	30.29	30.30	30.16	30.18	30.20	30.32	30.46	30.59	30.64
Cairo, Ill.....	30.76	30.64	30.53	30.33	30.29	30.22	30.22	30.23	30.31	30.47	30.60	30.65
Springfield, Ill.....	30.71	30.66	30.51	30.33	30.34	30.22	30.24	30.26	30.35	30.49	30.65	30.68
Saint Louis, Mo.....	30.74	30.65	30.53	30.32	30.30	30.20	30.22	30.23	30.33	30.49	30.61	30.66
Missouri Valley:												
Leavenworth, Kans.....	30.76	30.61	30.55	30.36	30.25	30.17	30.19	30.20	30.34	30.48	30.64	30.68
Omaha, Nebr.....	30.78	30.67	30.56	30.40	30.26	30.16	30.20	30.22	30.36	30.49	30.66	30.70
Bennett, Fort, Dak.....	30.79	30.73	30.66	30.55	30.29	30.12	30.17	30.22	30.33	30.46	30.62	30.64
Huron, Dak.....	30.82	30.73	30.67	30.54	30.22	30.15	30.18	30.28	30.34	30.50	30.66	30.79
Yankton, Dak.....	30.82	30.74	30.67	30.49	30.31	30.20	30.23	30.27	30.42	30.56	30.75	30.77
Extreme Northwest:												
Moorhead, Minn.....	30.79	30.76	30.62	30.53	30.32	30.13	30.20	30.27	30.33	30.51	30.66	30.75
Saint Vincent, Minn.....	30.78	30.84	30.64	30.56	30.33	30.16	30.19	30.28	30.36	30.49	30.66	30.73
Bismarck, Dak.....	30.67	30.65	30.57	30.45	30.27	30.20	30.17	30.26	30.34	30.52	30.69	30.67
Buford, Fort, Dak.....	30.80	30.79	30.68	30.55	30.22	30.10	30.17	30.21	30.35	30.46	30.70	30.69
Northern Slope:												
Assinaboine, Fort, Mont.....	30.69	30.75	30.59	30.56	30.30	30.17	30.16	30.18	30.44	30.47	30.64	30.78
Benton, Fort, Mont.....	30.61	30.58	30.51	30.44	30.33	30.26	30.24	30.28	30.51	30.49	30.67	30.65
Custer, Fort, Mont.....	30.72	30.67	30.53	30.52	30.24	30.08	30.11	30.20	30.39	30.47	30.67	30.63
Helena, Mont.....	30.60	30.58	30.49	30.40	30.28	30.13	30.17	30.19	30.43	30.47	30.66	30.74
Magiana, Fort, Mont.....	30.63	30.66	30.54	30.39	30.26	30.12	30.09	30.16	30.40	30.52	30.67	30.63
Shaw, Fort, Mont.....	30.68	30.64	30.53	30.48	30.30	30.20	30.15	30.18	30.59	30.58	30.61	30.70
Deadwood, Dak.....	30.56	30.55	30.54	30.46	30.14	30.04	30.08	30.15	30.33	30.42	30.62	30.72
Cheyenne, Wyo.....	30.26	30.27	30.26	30.22	30.19	30.18	30.19	30.22	30.32	30.33	30.44	30.56
North Platte, Nebr.....	30.49	30.42	30.35	30.23	30.08	30.02	29.96	30.04	30.18	30.33	30.53	30.54
Middle Slope:												
Denver, Colo.....	30.36	30.33	30.33	30.30	30.25	30.20	30.21	30.25	30.35	30.36	30.44	30.43
Pike's Peak, Colo.....	30.17	30.19	30.22	30.14	30.15	30.25	30.31	30.30	30.59	30.31	30.35	30.37
W. Las Animas, Colo.....	30.54	30.52	30.51	30.38	30.17	30.04	30.04	30.06	30.23	30.37	30.59	30.67
Dodge City, Kans.....	30.65	30.40	30.36	30.22	30.04	30.02	29.98	30.03	30.16	30.38	30.51	30.52
Elllett, Fort, Tex.....	30.42	30.32	30.26	30.10	29.94	30.01	30.03	30.12	30.24	30.40	30.62	30.54
Southern Slope:												
Sill, Fort, Ind. T.....	30.58	30.47	30.43	30.28	30.18	30.08	30.08	30.05	30.22	30.37	30.53	30.64
Concho, Fort, Tex.....	30.50	30.43	30.33	30.21	30.00	30.01	30.00	30.00	30.18	30.39	30.50	30.61
Davis, Fort, Tex.....	30.49	30.41	30.36	30.18	30.10	30.00	30.05	30.20	30.24	30.37	30.46	30.48
Stockton, Fort, Tex.....	30.47	30.39	30.34	30.26	30.14	30.08	30.08	30.13	30.22	30.33	30.48	30.53
Southern Plateau:												
Santa Fe, N. Mex.....	30.14	30.11	30.09	30.03	29.98	30.00	30.05	30.06	30.10	30.15	30.20	30.13
El Paso, Tex.....	30.56	30.46	30.31	30.27	30.11	29.97	30.03	30.05	30.17	30.32	30.53	30.54
Apache, Fort, Ariz.....	30.48	30.53	30.43	30.33	30.21	30.02	30.07	30.07	30.16	30.27	30.49	30.50
Grant, Fort, Ariz.....	30.32	30.26	30.20	30.12	30.04	30.01	30.04	30.05	30.08	30.18	30.30	30.34
Prescott, Ariz.....	30.30	30.38	30.33	30.23	30.16	30.00	30.12	30.11	30.19	30.27	30.40	30.43
Thomas, Camp, Ariz.....	30.44	30.41	30.23	30.16	30.02	29.94	29.92	29.96	30.02	30.19	30.40	30.40
Yuma, Ariz.....	30.43	30.38	30.21	30.15	30.04	29.94	29.93	29.95	29.99	30.14	30.31	30.40
Middle Plateau:												
Winnemucca, Nev.....	30.47	30.47	30.40	30.24	30.25	30.12	30.11	30.28	30.23	30.38	30.52	30.56
Salt Lake City, Utah.....	30.49	30.47	30.37	30.24	30.19	30.13	30.09	30.11	30.23	30.33	30.52	30.53

Mean of the highest pressure (reduced to sea-level) at stations of the Signal Service, &c.—
Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Northern Plateau:	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Boise City, Idaho	30.66	30.61	30.54	30.35	30.37	30.24	30.14	30.19	30.34	30.45	30.68	30.70
Lewiston, Idaho	30.80	30.66	30.45	30.29	30.31	30.18	30.23	30.23	30.33	30.43	30.64	30.68
Dayton, Wash	30.75	30.61	30.48	30.29	30.32	30.20	30.23	30.24	30.31	30.40	30.56	30.68
Spokane Falls, Wash	30.71	30.61	30.47	30.30	30.33	30.17	30.18	30.23	30.32	30.41	30.54	30.67
North Pacific Coast:												
Olympia, Wash	30.57	30.54	30.47	30.35	30.37	30.27	30.27	30.22	30.34	30.46	30.51	30.50
Tacoma Island, Wash	30.54	30.55	30.33	30.29	30.32	30.19	30.21	30.26	30.25	30.40	30.43	30.46
Portland, Oreg	30.59	30.56	30.47	30.45	30.40	30.34	30.29	30.27	30.32	30.46	30.49	30.52
Roseburg, Oreg	30.59	30.53	30.48	30.40	30.37	30.30	30.24	30.21	30.31	30.48	30.54	30.54
Middle Pacific Coast:												
Cape Mendocino, Cal	30.44	30.50	30.25	30.28	30.26	30.26	30.18	30.15	30.16	30.29	30.31	30.35
Red Bluff, Cal	30.51	30.47	30.37	30.29	30.19	30.14	30.05	30.07	30.11	30.28	30.43	30.46
Sacramento, Cal	30.49	30.46	30.34	30.28	30.19	30.13	30.06	30.08	30.11	30.25	30.41	30.45
San Francisco, Cal	30.44	30.44	30.34	30.32	30.20	30.17	30.11	30.13	30.13	30.25	30.37	30.39
South Pacific Coast:												
Los Angeles, Cal	30.37	30.35	30.26	30.21	30.14	30.08	30.05	30.05	30.06	30.15	30.26	30.34
San Diego, Cal	30.33	30.33	30.27	30.23	30.12	30.08	30.07	30.05	30.06	30.14	30.24	30.30
Alaska Stations:												
Saint Michael's, Port,												
Alaska	30.56	30.71	30.38	30.42	30.36	30.26	30.22	30.20	30.16	30.40	30.42	30.59
Sitka, Alaska	30.49	30.74	30.34	30.48	30.44	30.27	30.36	30.23	30.34	30.37	30.38	30.44
Unalakshik, Alaska	30.50	30.71	30.48	30.38	30.41	30.39	30.40	30.34	30.35	30.47	30.48	30.50
Behring's Island,												
Behring Sea	30.13	30.54	30.21	30.36	30.38	30.28	30.09	30.20	30.40	30.29	30.39	30.21

APPENDIX 7.

Mean of the lowest pressure (reduced to sea-level) at stations of the Signal Service, United States Army, for each month of the year. (Compiled from the commencement of observations at each station, to and including December, 1884.)

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
New England:	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Eastport, Me.	29.12	29.05	29.09	29.12	29.42	29.42	29.49	29.52	29.46	29.29	29.09	29.09
Portland, Me.	29.26	29.19	29.13	29.24	29.48	29.48	29.56	29.61	29.52	29.34	29.25	29.18
Mt. Washington, N. H.	29.17	29.14	29.13	29.24	29.49	29.67	29.75	29.82	29.65	29.46	29.24	29.16
Boston, Mass.	29.31	29.24	29.17	29.39	29.51	29.52	29.63	29.62	29.57	29.43	29.26	29.29
Block Island, R. I.	29.34	29.30	29.21	29.30	29.53	29.61	29.62	29.68	29.64	29.53	29.54	29.42
New Haven, Conn.	29.39	29.30	29.24	29.39	29.54	29.56	29.65	29.67	29.62	29.47	29.35	29.37
New London, Conn.	29.38	29.28	29.23	29.35	29.55	29.57	29.66	29.67	29.62	29.47	29.33	29.35
Middle Atlantic States:												
Albany, N. Y.	29.38	29.34	29.28	29.30	29.54	29.55	29.59	29.63	29.60	29.46	29.39	29.43
New York City.	29.40	29.33	29.30	29.43	29.57	29.59	29.63	29.70	29.65	29.50	29.39	29.40
Philadelphia, Pa.	29.43	29.37	29.30	29.45	29.57	29.62	29.67	29.69	29.65	29.51	29.42	29.42
Atlantic City, N. J.	29.40	29.36	29.30	29.42	29.58	29.62	29.66	29.68	29.64	29.51	29.51	29.39
Barnegat City, N. J.	29.38	29.34	29.28	29.41	29.57	29.60	29.63	29.66	29.63	29.49	29.45	29.39
Cape May, N. J.	29.45	29.38	29.31	29.46	29.58	29.63	29.70	29.68	29.64	29.51	29.42	29.39
Sandy Hook, N. J.	29.38	29.32	29.32	29.41	29.57	29.59	29.64	29.67	29.64	29.51	29.45	29.39
Del. Breakwater, Del.	29.30	29.37	29.35	29.47	29.59	29.64	29.68	29.70	29.67	29.59	29.53	29.54
Baltimore, Md.	29.47	29.43	29.34	29.48	29.59	29.64	29.70	29.71	29.64	29.51	29.47	29.43
Washington City.	29.48	29.45	29.37	29.49	29.58	29.64	29.70	29.71	29.63	29.50	29.47	29.53
Cape Henry, Va.	29.46	29.45	29.38	29.45	29.61	29.65	29.70	29.66	29.63	29.57	29.54	29.43
Chincoteague, Va.	29.35	29.44	29.37	29.47	29.60	29.66	29.67	29.72	29.67	29.63	29.58	29.57
Lynchburg, Va.	29.52	29.50	29.39	29.49	29.61	29.64	29.71	29.71	29.68	29.59	29.52	29.48
Norfolk, Va.	29.49	29.46	29.40	29.49	29.62	29.67	29.72	29.71	29.65	29.58	29.50	29.43
South Atlantic States:												
Charlotte, N. C.	29.54	29.63	29.51	29.52	29.66	29.66	29.72	29.75	29.76	29.76	29.70	29.63
Hatteras, N. C.	29.40	29.54	29.48	29.38	29.58	29.71	29.72	29.78	29.74	29.70	29.64	29.64
Kitty Hawk, N. C.	29.46	29.48	29.40	29.46	29.65	29.69	29.74	29.71	29.70	29.61	29.59	29.47
Macon, Fort, N. C.	29.48	29.56	29.52	29.42	29.60	29.73	29.72	29.78	29.74	29.73	29.68	29.73
Smithville, N. C.	29.58	29.62	29.47	29.53	29.71	29.75	29.77	29.78	29.57	29.63	29.71	19.57
Wilmington, N. C.	29.59	29.58	29.48	29.54	29.67	29.72	29.78	29.78	29.56	29.62	29.62	29.52
Charleston, S. C.	29.67	29.68	29.57	29.58	29.71	29.77	29.81	29.78	29.66	29.66	29.70	29.63
Augusta, Ga.	29.65	29.66	29.60	29.60	29.71	29.75	29.79	29.80	29.71	29.72	29.72	29.67
Savannah, Ga.	29.68	29.70	29.62	29.62	29.72	29.78	29.82	29.77	29.68	29.70	29.72	29.66
Jacksonville, Fla.	29.72	29.75	29.68	29.67	29.74	29.81	29.84	29.82	29.68	29.72	29.75	29.72
Florida Peninsula:												
Cedar Key, Fla.	29.73	29.83	29.82	29.77	29.79	29.83	29.91	29.75	29.79	29.83	29.83	29.86
Key West, Fla.	29.90	29.91	29.88	29.81	29.83	29.91	29.93	29.86	29.77	29.65	29.82	29.86
Sanford, Fla.	29.76	29.73	29.84	29.62	29.79	29.79	29.88	29.82	29.82	29.84	29.84	29.92
Eastern Gulf States:												
Atlanta, Ga.	29.64	29.66	29.62	29.66	29.71	29.73	29.80	29.79	29.72	29.81	29.70	29.70
Pensacola, Fla.	29.80	29.74	29.78	29.74	29.77	29.81	29.87	29.72	29.71	29.83	29.84	29.80
Mobile, Ala.	29.79	29.69	29.70	29.67	29.76	29.82	29.87	29.79	29.71	29.78	29.76	29.70
Montgomery, Ala.	29.74	29.66	29.66	29.64	29.74	29.79	29.84	29.80	29.73	29.79	29.75	29.70
Vicksburg, Miss.	29.77	29.65	29.66	29.59	29.73	29.80	29.80	29.77	29.77	29.84	29.76	29.74
New Orleans, La.	29.80	29.69	29.70	29.64	29.75	29.81	29.87	29.80	29.69	29.81	29.77	29.72
Western Gulf States:												
Shreveport, La.	29.73	29.58	29.61	29.54	29.67	29.76	29.84	29.75	29.78	29.75	29.67	29.70
Fort Smith, Ark.	29.75	29.59	29.60	29.43	29.65	29.66	29.78	29.83	29.77	29.71	29.70	29.55
Little Rock, Ark.	29.71	29.58	29.59	29.48	29.69	29.73	29.82	29.73	29.78	29.74	29.73	29.61
Galveston, Tex.	29.80	29.67	29.67	29.59	29.72	29.81	29.85	29.78	29.71	29.81	29.74	29.77
Indianola, Tex.	29.78	29.68	29.66	29.58	29.70	29.79	29.87	29.82	29.79	29.82	29.75	29.76
Palestine, Tex.	29.86	29.69	29.67	29.55	29.70	29.76	29.87	29.86	29.83	29.80	29.80	29.68
Rio Grande Valley:												
Brownsville, Tex.	29.78	29.64	29.65	29.54	29.67	29.71	29.83	29.78	29.78	29.76	29.74	29.73
Rio Grande City, Tex.	29.79	29.59	29.64	29.54	29.60	29.75	29.78	29.68	29.77	29.76	29.73	29.74
Ohio Valley and Tennessee:												
Chattanooga, Tenn.	29.69	29.63	29.59	29.62	29.71	29.73	29.79	29.80	29.74	29.81	29.80	29.77
Knoxville, Tenn.	29.64	29.57	29.52	29.56	29.58	29.71	29.76	29.80	29.74	29.77	29.68	29.61
Memphis, Tenn.	29.69	29.53	29.56	29.52	29.67	29.72	29.82	29.77	29.76	29.70	29.65	29.65
Nashville, Tenn.	29.64	29.52	29.51	29.52	29.64	29.70	29.78	29.77	29.74	29.77	29.67	29.64
Louisville, Ky.	29.54	29.48	29.42	29.48	29.62	29.69	29.72	29.73	29.71	29.68	29.57	29.57
Indianapolis, Ind.	29.52	29.45	29.38	29.43	29.53	29.55	29.68	29.70	29.68	29.62	29.50	29.53
Cincinnati, Ohio.	29.54	29.48	29.38	29.48	29.59	29.59	29.70	29.72	29.72	29.66	29.54	29.55
Columbus, Ohio.	29.54	29.50	29.40	29.46	29.58	29.58	29.64	29.71	29.69	29.67	29.57	29.65
Pittsburg, Pa.	29.47	29.43	29.35	29.42	29.52	29.59	29.66	29.68	29.68	29.55	29.44	29.47

Mean of the lowest pressure (reduced to sea-level) at stations of the Signal Service, &c.—
Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Lower Lakes:	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Buffalo, N. Y.	29.42	29.39	29.28	29.37	29.50	29.54	29.56	29.61	29.57	29.45	29.43	29.40
Oswego, N. Y.	29.42	29.41	29.24	29.41	29.53	29.57	29.58	29.62	29.58	29.45	29.36	29.36
Rochester, N. Y.	29.42	29.40	29.26	29.40	29.51	29.55	29.56	29.60	29.59	29.46	29.35	29.37
Erie, Pa.	29.45	29.40	29.29	29.38	29.52	29.55	29.60	29.64	29.60	29.47	29.39	29.43
Cleveland, Ohio.	29.49	29.42	29.35	29.41	29.52	29.54	29.63	29.67	29.66	29.53	29.42	29.48
Sandusky, Ohio.	29.52	29.43	29.36	29.39	29.57	29.52	29.62	29.69	29.65	29.62	29.49	29.49
Toledo, Ohio.	29.48	29.41	29.28	29.38	29.50	29.56	29.62	29.66	29.63	29.54	29.42	29.47
Detroit, Mich.	29.48	29.38	29.27	29.35	29.48	29.49	29.60	29.63	29.61	29.49	29.38	29.43
Upper Lakes:												
Alpena, Mich.	29.38	29.31	29.26	29.30	29.45	29.45	29.56	29.57	29.47	29.34	29.37	29.31
Escanaba, Mich.	29.39	29.33	29.29	29.32	29.46	29.41	29.55	29.60	29.47	29.32	29.38	29.30
Grand Haven, Mich.	29.45	29.38	29.25	29.31	29.50	29.49	29.62	29.66	29.59	29.46	29.38	29.40
Mackinaw City, Mich.	29.32	29.46	29.22	29.30	29.50	29.60	29.48	29.56	29.41	29.50	29.48	29.41
Marquette, Mich.	29.41	29.34	29.29	29.31	29.45	29.40	29.46	29.57	29.49	29.29	29.39	29.32
Port Huron, Mich.	29.44	29.37	29.26	29.34	29.48	29.50	29.57	29.61	29.59	29.49	29.36	29.42
Chicago, Ill.	29.48	29.41	29.28	29.33	29.49	29.49	29.62	29.69	29.58	29.49	29.45	29.44
Milwaukee, Wis.	29.43	29.37	29.26	29.31	29.49	29.47	29.62	29.65	29.56	29.45	29.40	29.39
Duluth, Minn.	29.40	29.41	29.35	29.34	29.44	29.42	29.53	29.58	29.50	29.32	29.46	29.40
Upper Mississippi Valley:												
Saint Paul, Minn.	29.42	29.41	29.33	29.34	29.38	29.37	29.53	29.55	29.50	29.32	29.45	29.41
La Crosse, Wis.	29.48	29.44	29.30	29.32	29.45	29.46	29.60	29.62	29.55	29.47	29.46	29.41
Davenport, Iowa.	29.52	29.40	29.39	29.36	29.49	29.52	29.63	29.71	29.67	29.49	29.45	29.41
Des Moines, Iowa.	29.51	29.44	29.30	29.36	29.48	29.44	29.66	29.70	29.60	29.48	29.56	29.50
Dubuque, Iowa.	29.52	29.45	29.29	29.35	29.49	29.49	29.65	29.68	29.62	29.45	29.44	29.44
Keokuk, Iowa.	29.50	29.39	29.31	29.36	29.47	29.51	29.63	29.70	29.63	29.48	29.46	29.47
Quincy, Ill.	29.65	29.51	29.49	29.48	29.65	29.67	29.78	29.78	29.77	29.71	29.66	29.61
Springfield, Ill.	29.59	29.46	29.35	29.46	29.57	29.57	29.72	29.76	29.70	29.61	29.63	29.48
Saint Louis, Mo.	29.59	29.40	29.41	29.42	29.55	29.61	29.71	29.76	29.72	29.62	29.55	29.55
Missouri Valley:												
Leavenworth, Kans.	29.53	29.40	29.37	29.34	29.40	29.50	29.64	29.68	29.61	29.46	29.50	29.50
Omaha, Nebr.	29.46	29.39	29.32	29.29	29.33	29.42	29.58	29.63	29.54	29.45	29.50	29.51
Bennett, Fort, Dak.	29.58	29.51	29.44	29.45	29.32	29.50	29.58	29.50	29.54	29.53	29.59	29.61
Huron, Dak.	29.59	29.51	29.40	29.48	29.32	29.52	29.54	29.51	29.55	29.48	29.61	29.59
Yankton, Dak.	29.48	29.45	29.35	29.35	29.32	29.43	29.53	29.57	29.50	29.40	29.50	29.55
Extreme Northwest:												
Moorhead, Minn.	29.50	29.54	29.48	29.54	29.43	29.52	29.56	29.50	29.52	29.38	29.58	29.56
Saint Vincent, Minn.	29.42	29.45	29.37	29.51	29.48	29.53	29.45	29.43	29.44	29.36	29.49	29.51
Bismarck, Dak.	29.58	29.45	29.31	29.40	29.32	29.42	29.45	29.47	29.44	29.38	29.44	29.47
Burford, Fort, Dak.	29.40	29.43	29.42	29.39	29.39	29.45	29.49	29.45	29.44	29.41	29.44	29.52
Northern Slope:												
Assiniboine, Fort, Mont.	29.67	29.64	29.60	29.50	29.63	29.65	29.60	29.58	29.64	29.60	29.70	29.58
Benton, Fort, Mont.	29.49	29.57	29.49	29.48	29.59	29.65	29.64	29.72	29.65	29.60	29.63	29.55
Custer, Fort, Mont.	29.76	29.52	29.58	29.51	29.58	29.55	29.51	29.64	29.63	29.59	29.80	29.72
Helena, Mont.	29.78	29.59	29.65	29.61	29.62	29.61	29.65	29.68	29.72	29.67	29.89	29.70
Maginnis, Fort, Mont.	29.83	29.60	29.61	29.50	29.60	29.66	29.65	29.68	29.74	29.76	29.79	29.63
Shaw, Fort, Mont.	29.71	29.62	29.68	29.48	29.62	29.62	29.61	29.64	29.64	29.68	29.78	29.60
Deadwood, Dak.	29.71	29.66	29.56	29.51	29.41	29.51	29.57	29.64	29.65	29.63	29.57	29.72
Cheyenne, Wyo.	29.51	29.55	29.50	29.45	29.52	29.65	29.78	29.79	29.73	29.59	29.66	29.58
North Platte, Nebr.	29.23	29.26	29.06	29.09	29.09	29.20	29.26	29.29	29.27	29.18	29.31	29.32
Middle Slope:												
Denver, Colo.	29.53	29.54	29.49	29.44	29.50	29.62	29.75	29.73	29.69	29.62	29.68	29.60
Pike's Peak, Colo.	29.46	29.49	29.46	29.43	29.55	29.76	30.00	29.95	29.82	29.63	29.61	29.49
West Las Animas, Colo.	29.68	29.50	29.57	29.26	29.32	29.50	29.56	29.54	29.57	29.54	29.72	29.64
Dodge City, Kans.	29.32	29.22	29.10	29.06	29.04	29.28	29.38	29.40	29.34	29.29	29.33	29.30
Elliott, Fort, Tex.	29.39	29.31	29.33	29.17	29.22	29.49	29.60	29.72	29.67	29.67	29.72	29.52
Southern Slope:												
Sill, Fort, Ind. T.	29.54	29.43	29.38	29.26	29.40	29.49	29.66	29.62	29.61	29.54	29.54	29.46
Concho, Fort, Tex.	29.47	29.40	29.42	29.28	29.40	29.50	29.56	29.61	29.57	29.56	29.50	29.57
Davis, Fort, Tex.	29.88	29.84	29.80	29.75	29.79	29.81	29.83	29.92	29.85	29.84	29.90	29.90
Stockton, Fort, Tex.	29.71	29.66	29.59	29.49	29.66	29.67	29.79	29.80	29.79	29.74	29.73	29.78
Southern Plateau:												
Santa Fé, N. Mex.	29.38	29.43	29.46	29.40	29.47	29.61	29.73	29.74	29.71	29.59	29.58	29.42
El Paso, Tex.	29.89	29.81	29.78	29.62	29.59	29.62	29.71	29.74	29.68	29.75	29.84	29.88
Apache, Fort, Ariz.	29.94	29.94	29.89	29.86	29.85	29.72	29.83	29.83	29.79	29.75	29.79	29.90
Grant, Fort, Ariz.	29.79	29.77	29.77	29.71	29.74	29.75	29.83	29.79	29.77	29.77	29.79	29.80
Prescott, Ariz.	29.78	29.73	29.77	29.72	29.77	29.76	29.84	29.82	29.80	29.79	29.82	29.82
Thomas, Camp, Ariz.	29.81	29.76	29.76	29.65	29.64	29.61	29.64	29.68	29.61	29.62	29.88	29.75
Yuma, Ariz.	29.77	29.70	29.71	29.66	29.61	29.56	29.59	29.58	29.62	29.64	29.64	29.65
Middle Plateau:												
Winnemucca, Nev.	29.64	29.65	29.58	29.56	29.65	29.69	29.71	29.71	29.76	29.67	29.76	29.71
Salt Lake City, Utah	29.60	29.59	29.54	29.50	29.58	29.59	29.65	29.68	29.64	29.61	29.69	29.64
Northern Plateau:												
Boise City, Idaho	29.64	29.64	29.60	29.56	29.68	29.66	29.59	29.62	29.66	29.61	29.72	29.70
Lewiston, Idaho	29.56	29.45	29.40	29.50	29.58	29.61	29.65	29.65	29.60	29.51	29.66	29.40

Mean of the lowest pressure (reduced to sea-level) at stations of the Signal Service, &c.—
Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Northern Plateau—Continued:	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Dayton, Wash	29.57	29.46	29.44	29.54	29.60	29.71	29.78	29.77	29.78	29.56	29.72	29.48
Spokane Falls, Wash	29.63	29.42	29.43	29.46	29.59	29.66	29.70	29.72	29.70	29.54	29.68	29.47
North Pacific Coast:												
Olympia, Wash	29.35	29.34	29.33	29.50	29.66	29.72	29.75	29.74	29.57	29.40	29.44	29.34
Tatoosh Island, Wash	29.44	29.21	29.40	29.46	29.74	29.74	29.86	29.77	29.36	29.48	29.56	29.12
Portland, Oreg	29.35	29.53	29.47	29.60	29.71	29.76	29.80	29.80	29.71	29.50	29.52	29.51
Roseburg, Oreg	29.49	29.51	29.47	29.55	29.71	29.77	29.79	29.78	29.70	29.57	29.61	29.55
Middle Pacific Coast:												
Cape Mendocino, Cal.	29.59	29.40	29.24	29.48	29.74	29.74	29.81	29.82	29.68	29.61	29.81	29.50
Red Bluff, Cal	29.66	29.63	29.58	29.64	29.73	29.64	29.63	29.64	29.69	29.68	29.77	29.60
Sacramento, Cal	29.73	29.66	29.66	29.68	29.75	29.70	29.70	29.69	29.71	29.73	29.79	29.66
San Francisco, Cal.	29.65	29.68	29.73	29.75	29.81	29.78	29.78	29.78	29.76	29.77	29.79	29.69
South Pacific Coast:												
Los Angeles, Cal.	29.79	29.76	29.84	29.82	29.82	29.81	29.80	29.78	29.77	29.78	29.76	29.76
San Diego, Cal	29.81	29.79	29.84	29.85	29.83	29.82	29.82	29.80	29.77	29.82	29.83	29.80
Alaska Stations:												
Saint Michael's, Fort, Alaska	28.82	29.22	29.30	29.15	29.17	29.42	29.42	29.33	29.15	29.07	28.92	29.06
Sitka, Alaska	29.13	29.02	29.25	29.18	29.32	29.45	29.62	29.55	29.26	29.04	28.92	28.74
Unalakshka, Alaska	28.39	29.09	29.10	29.00	29.05	29.20	29.40	29.12	28.90	28.70	28.63	28.61
Behring's Island, Behring Sea	28.78	29.00	29.03	29.18	29.13	29.45	29.46	29.30	29.02	28.89	28.43	28.79

APPENDIX 8.

Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year. (Computed from the commencement of observations at each, to and including July, 1872.)

[The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.35 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England:	°	°	°	°	°	°	°	°	°	°	°	°	°
Mount Washington, N. H.	3.6	5.6	-0.7	21.0	33.3	42.5	47.2	47.6	36.6	23.8	11.8	3.8	.....
Boston, Mass.	26.7	28.4	34.2	46.8	58.1	67.0	72.8	71.7	59.3	54.0	39.6	30.1	48.9
New London, Conn.	27.0	27.2	33.4	46.2	56.6	65.6	72.2	70.9	58.4	54.1	36.4	27.9	.....
Middle Atlantic States:													
New York City	29.9	31.0	36.2	50.4	61.0	69.8	74.0	73.0	60.8	54.9	43.8	32.1	51.0
Philadelphia, Pa.	32.2	34.1	40.2	54.2	64.6	71.4	76.8	76.9	62.6	56.5	40.0	30.2	54.5
Cape May, N. J.	30.9	30.2	33.3	47.9	58.4	68.0	73.2	75.0	63.8	58.3	42.4	32.8	.....
Baltimore, Md.	34.6	37.8	42.2	57.0	66.3	74.6	78.6	77.2	63.4	58.2	44.7	33.5	56.1
Washington City	32.2	34.8	41.7	57.1	65.6	74.3	77.6	76.8	62.9	58.1	43.4	33.0	54.8
Lynchburg, Va.	33.8	34.8	39.0	57.2	66.9	73.2	75.8	75.9	62.1	57.1	43.5	35.4	.....
Norfolk, Va.	41.0	41.6	48.1	61.1	70.0	75.6	79.0	79.3	67.5	62.4	48.9	41.0	60.6
South Atlantic States:													
Wilmington, N. C.	44.7	48.7	54.2	64.4	72.6	79.4	82.8	80.2	70.1	64.7	55.6	45.6	64.8
Charleston, S. C.	41.7	51.4	57.3	66.1	73.8	80.2	83.5	79.6	72.0	68.5	58.1	48.6	65.6
Savannah, Ga.	43.0	53.2	57.8	67.5	74.0	79.6	82.0	79.3	71.6	68.0	58.6	49.8	66.6
Florida Peninsula:													
Key West, Fla.	68.2	71.0	73.7	77.6	79.4	82.8	82.8	84.2	82.4	80.3	74.7	69.2	77.2
Eastern Gulf States:													
Mobile, Ala.	47.6	55.0	58.1	68.4	74.4	80.7	81.5	83.0	74.9	68.7	57.9	51.9	67.5
New Orleans, La.	50.8	57.9	61.8	69.3	74.4	81.2	82.8	82.8	75.8	70.7	60.1	51.6	69.2
Western Gulf States:													
Galveston, Tex.	49.7	55.3	60.8	71.8	77.2	82.8	86.0	85.1	78.8	71.7	60.3	56.0	.....
Ohio Valley and Tennessee:													
Knoxville, Tenn.	35.1	41.8	40.7	59.8	66.3	73.8	76.8	78.3	66.3	57.6	45.9	36.6	58.0
Memphis, Tenn.	45.4	42.3	51.2	63.4	71.0	79.8	78.8	82.3	68.2	61.9	48.5	39.8	.....
Nashville, Tenn.	38.0	40.7	49.9	63.4	70.2	77.7	79.6	80.4	68.7	61.0	46.4	42.4	.....
Indianapolis, Ind.	26.6	29.6	41.1	56.3	65.2	73.7	76.0	75.8	62.3	57.1	38.6	27.8	.....
Cincinnati, Ohio.	33.6	36.4	44.2	58.2	65.8	74.7	78.2	79.4	64.7	58.5	43.8	33.2	.....
Pittsburg, Pa.	27.8	30.5	39.0	54.4	63.5	72.0	73.4	73.3	59.5	54.8	38.2	30.2	.....
Lower Lakes:													
Buffalo, N. Y.	26.6	27.4	34.0	46.9	55.4	66.2	71.1	70.7	58.2	52.3	34.7	28.8	48.8
Oswego, N. Y.	25.0	24.6	31.4	45.0	54.0	64.4	70.1	70.2	57.7	58.5	35.8	28.2	47.1
Rochester, N. Y.	23.5	24.0	30.6	45.8	56.4	65.8	70.2	70.0	56.2	53.1	35.8	26.6	47.1
Cleveland, Ohio.	27.4	27.9	35.4	50.2	58.3	68.8	72.4	71.2	60.1	54.8	39.4	27.6	50.0
Toledo, Ohio	26.3	26.2	35.1	50.4	60.4	69.8	73.7	71.5	59.8	54.5	34.4	23.5	49.5
Detroit, Mich.	24.5	25.6	32.4	45.8	57.1	66.8	71.0	69.8	58.2	53.7	33.3	24.9	47.2
Upper Lakes:													
Escanaba, Mich.	15.9	16.3	15.6	36.1	46.5	62.0	65.6	65.0	53.7	46.8	31.6	13.2	.....
Grand Haven, Mich.	24.2	21.0	23.4	46.4	52.2	65.0	69.3	68.6	56.4	51.2	32.8	22.3	.....
Marquette, Mich.	18.6	17.2	15.7	38.1	46.9	61.2	64.0	65.6	55.3	46.0	29.9	13.7	.....
Chicago, Ill.	27.0	27.8	34.4	50.0	56.5	62.2	72.4	72.7	61.0	(1)	85.0	20.0	.....
Milwaukee, Wis.	22.8	24.0	29.3	44.0	53.6	65.6	68.8	69.7	58.1	48.8	36.8	20.8	45.3
Duluth, Minn.	12.2	17.1	22.0	37.7	49.4	60.8	66.2	63.5	56.0	44.7	31.0	14.8	39.4
Upper Mississippi Valley:													
Saint Paul, Minn.	15.2	20.1	31.1	45.6	58.6	67.4	70.6	68.2	58.2	46.7	33.6	15.9	43.6
Keokuk, Iowa.	24.9	31.0	34.4	54.0	64.4	75.2	78.4	75.6	63.3	57.0	35.4	25.2	.....
Quincy, Ill.	31.2	37.0	42.5	62.0	68.3	75.5	78.9	79.5	67.2	60.4	43.4	34.3	.....
Saint Louis, Mo.	33.0	36.0	44.4	58.9	68.1	78.0	79.5	78.1	66.0	50.0	39.8	30.2	67.5
Missouri Valley:													
Leavenworth, Kans.	24.7	30.9	36.3	56.6	64.5	76.9	77.9	72.8	70.7	56.2	36.4	24.1	.....
Omaha, Nebr.	21.6	28.9	36.0	52.2	62.2	74.1	75.8	78.6	62.2	53.2	30.7	18.3	60.1
Northern Slope:													
Cheyenne, Wyo.	27.4	30.5	33.2	39.3	52.6	68.3	65.8	65.4	57.4	44.8	33.8	24.1	45.6
Middle Pacific Coast:													
San Francisco, Cal.	52.2	54.2	52.8	53.4	55.1	58.0	57.2	57.9	60.4	61.8	54.9	52.9	.....

¹ No record.

APPENDIX 9.

Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year. (Computed from September, 1872, to and including October, 1879, except at stations opened subsequent to the former date.)

[The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.00 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England:	°	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me.	19.3	22.1	29.0	37.9	47.5	54.6	60.3	60.5	55.2	47.3	34.8	24.4	41.2
Portland, Me.	22.4	25.0	33.2	42.7	54.8	63.7	69.6	67.6	60.0	50.1	36.8	29.0	46.4
Monnt Washington, N. H.	4.9	5.5	12.8	20.8	33.0	44.0	48.3	46.9	40.0	30.3	16.4	8.1	26.1
Burlington, Vt.	18.6	20.1	29.2	41.3	55.5	66.2	71.1	68.6	60.2	48.9	34.5	22.7	45.0
Boston, Mass.	25.9	27.1	34.5	43.2	56.5	66.2	72.0	69.2	62.1	52.0	38.7	28.8	48.2
Wood's Holl, Mass.	30.2	30.5	35.6	42.9	52.9	62.5	68.8	68.6	62.7	54.9	42.7	34.3	48.9
New Haven, Conn.	28.2	29.4	36.1	45.9	58.7	68.4	73.8	71.1	64.0	51.0	40.6	30.5	50.2
New London, Conn.	28.4	29.1	33.7	44.7	56.3	65.7	71.6	69.9	63.1	53.3	40.5	31.1	49.3
Middle Atlantic States:													
Albany, N. Y.	21.7	22.4	31.3	43.1	57.6	67.4	71.0	70.0	61.3	49.8	37.2	26.2	46.7
New York City.	29.8	30.4	37.2	46.0	58.4	68.6	74.0	72.1	65.1	55.3	41.9	32.4	51.0
Philadelphia, Pa.	31.1	32.1	39.2	48.4	61.0	71.2	76.4	73.1	65.8	55.4	42.6	33.5	52.5
Atlantic City, N. J.	31.4	32.7	38.4	46.0	56.9	66.8	72.0	72.2	66.1	56.4	44.0	34.6	51.5
Barnegat City, N. J.	30.6	31.5	37.8	45.4	57.0	66.7	72.2	72.0	65.5	55.4	43.5	33.6	51.1
Cape May, N. J.	33.9	34.2	40.2	47.6	57.9	68.3	73.2	73.1	67.4	58.0	45.5	36.7	53.1
Sandy Hook, N. J.	30.5	30.8	37.3	45.3	58.1	68.5	74.2	72.8	65.8	56.0	43.4	34.0	51.5
Baltimore, Md.	34.3	35.9	42.2	51.9	63.6	74.0	79.2	74.9	67.4	56.8	44.6	36.4	55.2
Washington City.	33.6	35.2	42.7	51.0	63.6	73.9	79.1	74.1	67.1	57.3	43.7	35.5	54.8
Cape Henry, Va.	40.8	41.6	47.5	53.9	63.4	73.4	78.4	76.3	71.0	61.9	51.2	42.3	59.6
Lynchburg, Va.	36.8	39.7	46.8	55.6	65.5	74.7	80.2	75.3	68.3	57.1	45.3	37.7	57.0
Norfolk, Va.	40.6	41.6	48.3	55.2	65.2	75.8	80.1	76.6	70.2	59.6	48.8	40.8	58.7
South Atlantic States:													
Cape Hatteras, N. C.	45.3	45.6	51.6	56.6	64.7	73.7	79.8	77.7	72.7	64.3	55.7	47.1	61.4
Charlotte, N. C.	41.0	40.7	54.6	58.0	68.6	74.9	79.0	73.6	68.0	65.0	49.4	38.1	58.1
Kitty Hawk, N. C.	42.0	41.8	48.9	54.6	63.1	72.8	78.0	77.2	71.5	62.5	52.4	43.1	59.6
Smithville, N. C.	46.5	47.9	55.0	61.2	68.7	76.6	81.4	80.0	74.2	65.2	55.3	46.5	63.3
Wilmington, N. C.	46.4	47.8	54.6	61.0	68.5	75.7	80.3	78.0	73.1	65.0	56.7	46.0	62.4
Charleston, S. C.	49.9	51.3	57.7	64.0	72.3	79.3	83.7	80.8	76.1	65.6	56.7	46.0	65.3
Augusta, Ga.	47.4	49.3	56.4	63.3	72.0	78.8	83.2	80.7	74.4	62.8	52.9	45.8	63.9
Savannah, Ga.	51.6	53.0	59.6	66.1	73.8	80.0	82.8	80.8	75.8	68.4	57.1	50.7	66.4
Jacksonville, Fla.	55.6	57.0	62.7	68.7	75.4	80.4	82.8	80.9	77.8	68.6	60.8	54.3	68.9
Florida Peninsula:													
Key West, Fla.	69.6	71.3	73.5	76.5	80.1	83.0	83.6	84.3	83.0	78.5	74.1	69.5	77.3
Punta Raza, Fla.	64.1	65.8	68.6	72.2	76.7	80.3	81.3	81.2	80.1	74.8	69.0	63.6	73.3
Eastern Gulf States:													
Atlanta, Ga.	44.1	43.7	57.0	59.5	70.2	75.3	79.8	73.4	69.1	61.6	52.9	40.6	60.8
Mobile, Ala.	50.3	53.6	59.9	65.9	74.5	80.7	83.0	80.5	76.3	66.3	57.4	41.1	66.8
Montgomery, Ala.	48.4	51.6	57.7	64.0	73.6	79.5	83.1	80.5	75.2	63.9	54.3	48.0	65.2
Vicksburg, Miss.	47.6	52.0	59.4	64.4	73.3	79.0	82.0	80.0	75.1	64.8	54.7	49.1	65.3
New Orleans, La.	53.9	57.3	63.0	67.6	74.9	80.8	82.7	81.0	77.8	69.2	60.7	54.6	68.7
Western Gulf States:													
Shreveport, La.	46.1	51.4	59.7	64.8	73.7	80.4	83.2	82.0	74.9	65.4	54.6	48.8	65.5
Fort Gibson, Ind. T.	36.4	42.7	51.0	58.7	69.0	76.1	81.4	79.7	71.5	60.5	47.3	39.6	59.4
Corcoran, Tex.	44.7	51.5	59.5	65.4	73.1	79.3	81.2	82.5	75.9	66.8	55.0	48.8	64.9
Denison, Tex.	43.1	49.2	56.8	64.2	71.6	77.4	82.7	80.4	73.8	63.7	51.1	44.4	61.8
Galveston, Tex.	52.5	57.0	64.2	68.6	76.2	82.4	84.4	83.3	79.4	71.7	61.8	55.2	69.0
Indianola, Tex.	52.6	57.9	65.4	69.1	76.0	81.9	83.9	83.0	79.2	72.1	61.0	53.1	69.9
San Antonio, Tex.	51.6	55.2	66.5	70.7	77.2	81.5	83.6	83.5	78.8	71.4	58.4	52.6	68.6
Rio Grande Valley:													
Brownsville, Tex.	58.0	61.6	69.8	75.0	80.3	83.8	85.4	84.2	80.0	75.7	65.6	57.6	72.7
Rio Grande City, Tex.	58.9	61.2	74.5	78.1	83.2	85.4	87.9	83.3	78.0	73.2	67.5	54.7	71.1
Ohio Valley and Tennessee:													
Knoxville, Tenn.	37.2	40.4	47.9	56.2	66.4	73.3	77.4	74.5	67.8	56.1	45.1	38.3	56.7
Memphis, Tenn.	40.0	44.3	52.2	59.8	70.8	77.7	82.1	78.7	71.0	59.9	49.0	41.6	60.7
Nashville, Tenn.	38.6	42.5	49.8	58.6	69.8	77.4	81.7	78.2	70.3	58.7	47.3	40.3	59.6
Louisville, Ky.	34.2	37.6	45.0	55.1	66.8	75.4	80.1	76.3	68.2	57.4	44.1	37.3	56.6
Indianapolis, Ind.	29.6	33.2	40.3	51.9	63.9	72.0	77.3	73.8	65.1	53.3	40.4	33.3	52.2
Cincinnati, Ohio	33.5	36.5	43.2	53.6	65.6	74.5	79.1	75.0	67.2	56.3	43.8	36.8	55.6
Columbus, Ohio	25.4	29.0	41.4	50.5	65.1	71.7	78.9	73.6	63.4	52.7	42.2	30.4	48.4
Morgantown, W. Va.	33.8	35.3	41.2	50.8	62.1	71.1	75.2	71.4	63.1	53.6	41.8	36.1	53.1
Pittsburg, Pa.	30.0	31.5	38.3	48.1	60.8	71.1	75.2	71.4	63.7	52.6	39.4	32.4	51.3
Lower Lakes:													
Buffalo, N. Y.	24.4	24.0	30.6	40.5	53.2	65.0	70.3	69.1	61.6	50.4	36.8	28.3	46.2
Oswego, N. Y.	26.1	25.5	32.5	42.6	54.6	65.1	71.0	69.9	62.4	51.2	34.6	27.7	47.5
Rochester, N. Y.	23.9	24.0	31.1	42.6	56.5	66.8	71.5	69.4	61.3	49.0	35.7	29.4	46.8
Erie, Pa.	27.7	27.3	34.1	43.7	57.7	68.6	73.3	71.1	63.6	52.9	40.1	32.5	49.5

Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Lower Lakes—Cont'd.	°	°	°	°	°	°	°	°	°	°	°	°	°
Cleveland, Ohio.....	28.3	27.2	34.2	44.2	58.0	67.9	72.5	70.3	63.2	52.4	38.6	30.1	48.9
Sandusky, Ohio.....	28.6	30.4	40.8	50.5	59.3	68.9	75.0	72.9	64.1	55.5	42.9	34.5	52.0
Toledo, Ohio.....	37.4	29.4	38.1	47.1	57.6	70.3	74.5	71.5	63.4	52.6	38.9	30.3	50.1
Detroit, Mich.....	23.7	25.3	32.1	43.7	57.4	67.3	71.9	70.0	61.8	50.4	36.2	27.7	47.4
Upper Lakes:													
Alpena, Mich.....	18.4	18.3	24.4	36.2	48.7	58.9	66.2	64.7	53.3	44.8	32.1	22.5	41.2
Escanaba, Mich.....	14.3	16.4	23.3	35.5	49.3	60.0	67.6	65.5	50.6	44.2	31.2	21.4	40.4
Grand Haven, Mich.....	25.3	25.8	32.0	43.3	55.5	64.7	70.1	68.6	60.6	50.0	37.0	28.8	47.0
Marquette, Mich.....	17.4	19.3	25.8	37.2	49.7	59.0	66.5	66.0	56.7	45.8	31.7	22.2	41.5
Port Huron, Mich.....	21.6	22.8	29.9	41.6	53.3	63.2	69.6	68.3	60.2	49.6	36.8	26.8	45.2
Chicago, Ill.....	25.0	28.8	35.6	45.0	56.8	66.8	73.1	71.9	63.5	51.9	37.9	29.7	49.0
Milwaukee, Wis.....	19.7	23.8	30.6	41.3	53.0	63.1	69.7	68.9	60.8	47.0	33.9	24.9	44.6
Duluth, Minn.....	11.8	18.1	25.4	38.5	49.0	57.7	67.4	67.2	56.2	44.8	28.9	18.0	40.4
Upper Mississippi Valley:													
Saint Paul, Minn.....	13.9	18.6	28.0	44.1	58.6	67.3	73.1	70.1	58.2	46.4	30.2	20.6	43.8
La Crosse, Wis.....	16.3	22.3	31.9	46.5	60.4	68.0	74.4	71.5	60.7	49.4	32.9	23.2	46.6
Davenport, Iowa.....	20.8	26.9	35.6	48.4	61.3	70.6	75.9	73.5	63.6	51.9	35.7	26.9	49.3
Des Moines, Iowa.....	18.9	25.2	39.6	50.7	62.7	69.7	74.7	75.6	63.8	55.0	42.0	19.8	47.0
Dubuque, Iowa.....	13.2	25.0	33.6	47.9	61.4	68.7	75.7	72.8	62.8	51.2	34.6	26.7	48.8
Keokuk, Iowa.....	24.8	30.5	38.7	50.5	63.2	72.6	78.2	75.4	65.9	54.2	37.9	29.2	51.8
Calro, Ill.....	35.8	40.1	48.2	57.4	68.0	75.1	80.0	77.6	69.2	58.4	45.2	38.0	57.8
Saint Louis, Mo.....	33.1	36.1	43.5	54.0	66.0	74.5	79.7	76.6	67.3	57.0	42.2	34.7	55.5
Missouri Valley:													
Leavenworth, Kans.....	25.7	32.8	41.4	52.6	63.8	73.3	78.7	77.3	66.3	55.8	39.5	30.8	53.2
Omaha, Nebr.....	21.0	27.8	36.2	49.2	62.3	70.7	76.7	74.8	62.9	52.4	35.7	26.4	49.5
Yankton, Dak.....	14.9	21.4	30.1	45.2	59.4	67.9	74.1	72.2	60.8	48.8	31.8	21.8	45.8
Extreme Northwest:													
Breckenridge, Minn.....	2.9	8.4	19.2	39.4	55.3	63.8	69.1	66.3	54.0	42.9	28.2	11.5	37.9
Bismarck, Dak.....	6.3	11.8	22.1	41.4	54.7	62.3	70.6	67.9	55.8	43.5	24.2	17.3	39.8
Femblina, Dak.....	-0.2	7.4	15.1	35.9	52.9	61.8	67.2	64.2	52.0	39.0	18.0	8.6	36.0
Northern Slope:													
Benton, Fort, Mont.....	8.3	17.8	24.0	43.9	56.6	63.2	72.0	69.1	56.8	47.1	24.0	22.8	42.6
Cheyenne, Fort.....	24.3	29.0	33.6	39.2	51.8	61.4	68.3	65.8	55.2	44.5	38.6	27.1	44.2
North Platte, Nebr.....	20.0	28.7	35.6	47.3	58.9	67.8	74.5	72.4	61.4	49.7	35.1	27.6	47.6
Middle Slope:													
Denver, Colo.....	26.1	33.6	40.4	45.4	55.7	66.8	72.6	70.4	60.5	50.4	38.5	29.0	49.0
Pike's Peak, Colo.....	3.5	8.8	7.8	12.1	22.0	31.9	40.1	39.0	33.4	22.0	11.4	5.4	18.8
Dodge City, Kans.....	25.8	35.8	42.4	53.8	64.4	72.6	78.4	76.1	67.5	55.8	39.7	32.4	53.3
Southern Slope:													
Sill, Fort, Ind. T.....	36.4	43.9	55.5	62.1	70.7	78.9	81.7	79.4	72.9	63.0	48.8	37.1	60.6
Concho, Fort, Tex.....	43.8	48.3	61.0	66.3	76.4	79.9	83.8	80.4	74.0	65.8	51.2	43.6	63.7
Davis, Fort, Tex.....	49.7	51.4	50.7	64.0	72.6	74.6	76.2	72.8	68.8	62.4	55.1	39.1	62.9
Stockton, Fort, Tex.....	44.6	49.6	59.6	66.8	76.2	78.6	81.0	79.4	73.3	64.0	50.8	43.1	62.9
Southern Plateau:													
La Mesilla, N. Mex.....	40.0	47.9	56.2	58.6	70.0	76.6	80.0	78.6	73.0	61.3	47.4	40.7	59.8
Santa Fe, N. Mex.....	28.7	32.1	40.2	49.4	55.9	65.2	68.2	66.3	59.4	49.8	37.6	30.0	47.9
El Paso, Tex.....	53.2	57.3	63.6	63.3	73.9	81.2	83.2	80.8	75.7	67.4	57.9	49.0	69.0
Apache, Fort, Ariz.....	38.2	42.6	50.6	51.8	58.5	66.1	73.1	71.4	65.2	54.3	44.4	35.6	58.0
Florence, Ariz.....	51.3	54.4	61.6	67.8	74.8	83.6	91.0	88.5	82.0	69.9	58.2	52.5	69.8
Grant, Fort, Ariz.....	45.1	52.9	60.7	59.2	68.6	76.1	79.8	77.6	73.7	64.2	52.1	44.2	62.0
Prescott, Ariz.....	40.1	48.1	43.5	48.6	55.4	66.8	74.2	71.0	64.2	53.0	41.8	35.1	52.8
Tucson, Ariz.....	48.2	53.8	60.1	64.0	72.1	82.8	87.0	84.1	79.0	69.4	56.6	48.8	65.5
Yuma, Ariz.....	54.8	62.0	67.2	69.9	77.0	87.2	93.3	91.8	85.1	74.3	62.2	56.1	73.2
Middle Plateau:													
Pioche, Nev.....	29.4	35.8	45.2	47.0	54.1	64.0	72.4	72.6	63.8	50.9	41.8	32.6	50.1
Winnemucca, Nev.....	28.7	38.2	45.4	48.6	52.4	61.7	69.0	72.2	61.5	47.7	39.9	29.0	49.8
Salt Lake City, Utah.....	29.5	30.2	43.4	49.4	57.4	66.0	76.1	75.0	64.9	53.7	41.9	31.7	51.7
Northern Plateau:													
Boise City, Idaho.....	30.5	40.0	47.7	52.0	55.9	66.8	73.3	78.9	62.1	49.0	42.0	31.0	52.4
Umatilla, Oreg.....	32.0	40.3	50.6	54.0	59.8	68.8	73.9	75.1	64.4	51.5	43.9	34.2	54.8
North Pacific Coast:													
Olympia, Wash.....	38.5	42.4	46.2	48.2	53.6	58.7	61.9	63.1	55.8	48.7	45.8	41.4	50.8
Portland, Oreg.....	39.3	43.8	47.7	52.5	56.0	61.9	67.2	66.1	61.5	54.0	45.8	41.8	53.3
Roseburg, Oreg.....	40.8	48.2	50.6	51.2	54.6	61.8	65.8	66.9	60.9	51.3	47.7	40.4	53.1
Middle Pacific Coast:													
Red Bluff, Cal.....	45.8	51.6	56.2	61.0	65.1	80.2	82.5	82.2	75.9	64.3	54.8	47.3	64.0
Sacramento, Cal.....	47.6	53.2	57.0	59.8	62.8	72.0	73.4	73.7	70.7	62.4	55.1	47.9	61.8
San Francisco, Cal.....	51.3	52.8	53.4	55.0	56.2	59.2	58.2	58.8	60.0	59.9	57.1	51.8	56.2
South Pacific Coast:													
Campo, Cal.....	41.0	45.5	49.5	51.6	55.4	63.3	68.2	68.5	64.0	56.7	48.7	44.3	54.2
Los Angeles, Cal.....	53.6	55.2	57.2	58.2	61.0	65.4	68.5	69.4	67.5	63.6	60.2	55.2	60.7
San Diego, Cal.....	54.6	55.0	56.1	57.9	60.8	64.3	67.5	68.0	66.9	63.5	59.2	55.3	60.9
Visalia, Cal.....	46.9	53.2	57.8	60.4	65.5	76.4	79.2	78.6	72.4	61.1	52.6	46.2	61.9
Alaska Stations:													
Saint Michael's, Fort, Alaska.....	8.4	-3.4	7.4	10.5	32.6	46.9	53.8	51.5	44.2	29.4	13.0	5.9	25.3

APPENDIX 10.

Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year. (Computed from November, 1879, to December, 1884, both inclusive, except at stations opened subsequent to the former date.)

[The daily means are obtained by dividing the sum of the 7 a. m., 8 and 11 p. m. (Washington time), observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England:	°	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me.	19.8	23.2	27.9	37.8	47.1	56.2	60.5	61.1	56.5	46.7	36.1	25.7	41.6
Portland, Me.	24.6	28.7	34.0	44.7	55.1	65.0	69.6	68.6	62.8	51.0	39.6	30.1	47.8
Mount Washington, N. H.	6.1	8.8	9.6	20.1	34.2	44.8	46.7	47.2	42.6	30.2	17.2	11.8	26.5
Boston, Mass.	26.4	30.1	33.9	43.6	55.3	65.8	69.9	68.8	63.5	51.7	40.0	31.4	48.4
Block Island, R. I.	30.1	33.3	35.9	42.8	51.0	62.4	68.5	68.4	64.7	55.3	44.9	36.1	49.6
New Haven, Conn.	28.5	30.6	34.5	45.2	57.3	66.9	70.0	69.5	65.0	53.0	40.8	31.6	49.3
New London, Conn.	23.8	32.1	35.9	45.3	56.4	65.7	70.3	69.3	65.1	54.8	42.3	33.5	49.9
Middle Atlantic States:													
Albany, N. Y.	25.0	30.0	34.8	47.8	61.2	70.1	78.2	71.9	65.9	53.0	40.4	30.4	50.4
New York City	30.0	33.6	36.7	47.0	59.3	68.3	72.6	71.6	67.5	56.2	43.2	34.4	51.6
Philadelphia, Pa.	31.7	37.1	40.2	49.9	62.6	71.5	75.1	73.7	69.8	57.7	44.6	36.1	54.1
Atlantic City, N. J.	32.4	35.7	38.6	46.7	57.8	68.9	72.6	71.6	68.8	58.5	44.5	36.8	52.5
Barnegat City, N. J.	31.9	35.1	38.4	46.0	57.2	66.5	72.2	71.1	68.0	57.7	44.2	36.4	52.0
Cape May, N. J.	34.8	39.0	41.4	48.9	60.0	68.5	74.1	72.9	70.1	60.6	48.0	39.4	54.7
Sandy Hook, N. J.	30.8	34.1	37.6	47.1	59.5	68.8	74.0	72.8	69.0	57.9	45.0	35.8	52.7
Delaware Breakwater, Del.	32.1	36.6	40.4	48.1	59.7	68.2	73.2	72.4	69.9	60.8	47.5	38.2	54.0
Baltimore, Md.	34.4	39.7	42.5	52.6	63.3	73.6	76.9	74.7	70.2	59.6	46.0	38.3	56.1
Washington City	32.2	38.5	41.2	51.7	64.9	73.0	76.2	74.3	70.2	59.0	44.7	36.5	55.1
Cape Henry, Va.	39.9	45.0	48.4	54.0	65.2	73.3	77.3	76.1	73.4	64.6	52.4	46.6	59.2
Chincoteague, Va.	38.5	43.2	41.4	49.4	60.2	69.5	74.4	73.1	70.5	61.3	47.9	38.9	55.0
Lynchburg, Va.	37.5	43.8	46.1	55.9	68.0	74.8	78.0	76.0	71.1	61.1	46.7	40.4	48.2
Norfolk, Va.	40.7	46.6	48.0	55.6	67.6	75.2	78.9	76.7	73.1	63.7	51.2	44.6	60.1
South Atlantic States:													
Charlotte, N. C.	41.5	48.3	50.4	58.8	69.0	76.1	79.4	76.7	71.8	63.3	49.8	43.8	60.6
Hatteras, N. C.	43.2	49.9	50.0	58.2	68.0	74.2	78.2	77.4	75.3	67.6	56.2	47.3	61.8
Kitty Hawk, N. C.	42.2	46.7	47.5	53.6	64.8	73.5	78.2	76.3	74.0	65.5	53.6	48.4	60.1
Macqn, Fort, N. C.	43.8	49.8	51.4	57.1	68.0	75.0	78.8	77.7	75.0	67.6	55.5	48.4	62.4
Smithville, N. C.	47.3	51.9	53.9	60.2	70.2	77.0	80.7	78.8	74.8	66.8	54.6	49.4	63.7
Wilmington, N. C.	48.3	53.5	55.0	61.2	70.1	76.7	79.9	78.2	74.6	67.0	55.1	50.2	64.1
Charleston, S. C.	51.6	56.3	58.3	64.8	72.8	79.5	82.8	80.0	76.9	69.5	57.8	53.4	68.9
Augusta, Ga.	48.4	54.9	57.3	64.1	72.4	78.7	81.9	79.5	75.6	68.2	54.8	50.2	65.5
Savannah, Ga.	53.1	57.6	60.6	66.7	73.9	80.3	83.3	80.5	76.6	69.5	58.6	54.6	67.9
Jacksonville, Fla.	57.4	61.4	64.2	69.6	74.9	80.7	82.9	81.0	77.7	72.6	62.5	56.4	70.2
Florida Peninsula:													
Cedar Keys, Fla.	58.2	62.3	64.5	70.5	76.0	80.7	82.7	81.7	79.6	74.1	68.6	59.7	71.1
Key West, Fla.	71.8	73.1	73.0	77.2	80.0	83.7	85.3	84.2	82.7	79.4	75.4	71.9	78.2
Sanford, Fla.	55.6	65.3	68.4	70.8	75.5	78.6	82.4	80.4	78.0	74.8	67.1	64.0	71.6
Eastern Gulf States:													
Atlanta, Ga.	44.1	50.0	53.0	61.0	69.1	75.4	78.5	75.8	72.0	65.1	51.2	46.1	61.7
Pensacola, Fla.	54.1	58.4	61.8	67.9	73.9	79.7	81.0	80.3	77.3	71.9	59.4	55.4	68.4
Mobile, Ala.	52.3	57.1	61.2	68.0	74.4	80.7	81.1	80.4	77.3	71.4	58.8	53.4	68.0
Montgomery, Ala.	49.5	55.1	58.4	65.5	72.9	79.1	81.3	79.6	76.0	69.7	56.3	50.6	66.0
Vicksburg, Miss.	49.0	54.9	59.4	66.4	73.1	79.9	81.3	80.3	75.4	68.9	55.3	51.8	66.2
New Orleans, La.	55.9	60.5	63.9	70.0	75.6	81.1	83.0	82.0	78.9	73.2	61.4	57.4	70.2
Western Gulf States:													
Shreveport, La.	42.8	52.1	58.9	66.8	73.6	81.0	83.1	81.7	75.3	68.4	54.4	50.0	63.8
Fort Smith, Ark.	36.0	48.0	50.7	59.4	68.0	76.8	79.6	78.7	72.5	64.5	51.3	40.4	59.5
Little Rock, Ark.	42.5	48.3	54.1	62.7	70.0	77.9	80.0	78.6	72.6	65.5	51.5	45.3	62.3
Galveston, Tex.	52.6	58.0	64.0	69.9	76.3	82.4	84.0	83.4	80.1	74.7	62.2	57.3	70.6
Indianola, Tex.	53.0	58.2	64.7	70.8	76.4	82.0	83.2	82.3	79.4	74.6	62.5	57.3	70.2
Palestine, Tex.	42.0	54.0	60.8	65.2	70.6	78.6	81.5	79.6	75.8	68.7	56.7	49.7	65.0
Rio Grande Valley:													
Brownsville, Tex.	58.6	62.9	68.8	74.1	78.8	82.6	83.4	82.2	79.4	75.5	65.4	61.8	72.6
Rio Grande City, Tex.	57.6	64.4	69.7	76.2	80.3	85.3	86.8	83.1	82.5	74.8	68.6	60.2	72.1
Ohio Valley and Tennessee:													
Chattanooga, Tenn.	41.9	48.0	51.5	60.0	68.2	75.0	77.6	75.9	71.1	63.8	49.6	43.6	60.4
Knoxville, Tenn.	39.0	45.4	48.4	57.6	66.9	72.2	75.2	74.4	70.2	62.4	47.0	40.4	56.2
Memphis, Tenn.	40.8	47.0	52.1	62.0	70.6	78.0	80.4	78.9	72.6	65.2	50.1	43.7	61.7

Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Ohio Valley and Tennessee—													
Continued:													
Nashville, Tenn.	39.6	45.8	49.7	59.6	69.2	76.2	78.2	77.4	71.5	64.1	48.6	41.6	60.0
Louisville, Ky.	35.7	42.1	45.1	56.0	66.9	74.0	77.1	76.0	70.4	60.9	46.6	38.8	57.4
Indianapolis, Ind.	29.5	35.5	40.1	51.9	64.0	72.5	75.3	74.1	67.6	57.0	45.5	32.4	53.3
Cincinnati, Ohio	31.8	41.0	44.2	54.3	65.6	73.8	77.0	75.6	70.4	60.2	45.2	37.6	56.5
Columbus, Ohio	29.5	35.8	39.1	50.0	62.8	70.8	74.1	72.5	67.4	56.2	41.2	33.2	52.6
Pittsburg, Pa.	31.7	36.4	39.6	50.3	63.1	70.6	72.8	71.9	67.9	57.3	42.5	34.8	53.1
Lower Lakes:													
Buffalo, N. Y.	24.0	26.6	29.4	40.1	53.6	63.8	68.1	68.5	63.9	51.6	38.6	30.2	46.5
Oswego, N. Y.	25.7	28.9	31.6	41.9	54.9	63.7	68.7	68.6	63.5	51.4	39.4	30.4	47.4
Rochester, N. Y.	24.3	27.3	30.3	42.0	56.3	64.9	68.8	69.0	63.1	50.9	37.6	29.0	47.5
Erie, Pa.	27.4	30.7	33.1	43.6	57.5	66.3	70.3	69.7	64.9	54.6	40.9	32.7	49.3
Cleveland, Ohio	25.9	30.7	33.3	44.2	58.8	67.0	70.4	69.4	64.5	54.2	39.5	30.5	49.0
Sandusky, Ohio	27.4	32.0	35.1	45.6	60.7	68.5	72.2	71.4	66.4	55.0	40.6	31.8	50.8
Toledo, Ohio	27.3	32.0	36.0	46.9	60.4	69.3	73.1	71.4	66.2	54.8	40.8	31.8	50.8
Detroit, Mich.	25.8	31.0	34.6	45.6	58.8	67.8	71.2	70.3	65.2	54.8	40.0	31.2	49.7
Upper Lakes:													
Alpena, Mich.	18.0	19.6	24.1	36.1	49.2	59.0	64.3	64.0	58.0	46.3	32.2	23.6	41.2
Escanaba, Mich.	14.0	16.3	22.6	35.7	50.1	61.0	65.3	64.1	57.6	46.3	30.7	21.0	40.5
Grand Haven, Mich.	23.2	27.9	31.8	43.2	56.0	64.5	68.8	67.7	62.5	51.6	38.4	29.6	47.2
Marquette City, Mich.	14.8	14.0	20.2	36.6	46.2	59.9	61.9	62.1	57.8	48.5	35.7	25.5	40.0
Marquette, Mich.	16.5	17.7	23.5	36.5	49.5	58.1	63.8	63.2	56.9	46.0	30.8	22.2	40.5
Port Huron, Mich.	21.5	25.6	29.0	40.1	53.3	62.8	67.0	67.3	62.3	50.2	35.6	26.9	45.1
Chicago, Ill.	24.7	29.6	34.8	45.2	57.1	65.1	70.8	71.1	65.3	54.3	39.3	29.2	48.8
Milwaukee, Wis.	20.4	25.8	31.1	42.3	54.2	62.1	67.8	68.1	61.6	51.5	35.6	25.0	45.5
Duluth, Minn.	10.0	15.2	24.2	37.8	48.3	58.2	65.2	64.1	56.4	45.7	28.3	14.9	39.1
Upper Mississippi Valley:													
Saint Paul, Minn.	12.4	18.4	28.6	44.9	58.5	67.0	69.9	69.6	59.9	48.6	31.0	17.6	43.9
La Crosse, Wis.	16.0	22.7	31.0	47.0	60.7	69.1	71.5	70.8	62.7	51.4	34.2	21.6	46.6
Davenport, Iowa.	22.9	28.9	35.4	49.5	62.0	69.8	73.6	72.7	65.5	54.5	39.1	28.0	50.2
Des Moines, Iowa.	20.3	25.8	34.3	49.0	60.9	69.5	72.7	72.0	63.9	52.7	36.4	24.3	48.5
Dubuque, Iowa	19.0	25.0	33.0	47.8	60.6	68.4	72.0	71.1	63.3	52.1	35.8	24.2	47.8
Keokuk, Iowa	24.5	30.6	37.6	51.8	63.5	71.8	76.0	74.7	67.6	55.6	39.9	28.5	51.8
Cairo, Ill.	35.9	42.5	47.6	58.8	68.1	75.9	78.5	77.3	70.7	62.2	47.4	39.1	58.5
Springfield, Ill.	27.8	34.1	40.0	53.0	63.8	71.5	75.3	74.0	67.1	56.7	41.8	31.7	53.0
Saint Louis, Mo.	29.7	36.0	42.1	54.9	65.2	73.3	77.0	76.1	70.1	59.0	44.0	34.1	55.1
Missouri Valley:													
Leavenworth, Kans.	27.0	32.2	41.0	53.7	64.3	73.5	76.7	75.2	67.8	56.4	41.2	30.5	53.3
Omaha, Nebr.	20.5	25.2	34.7	49.7	62.5	72.1	75.3	73.9	65.8	53.7	37.0	27.7	49.5
Bennett, Fort, Dak.	10.4	10.2	29.4	43.0	56.5	66.2	70.8	71.8	60.1	46.3	29.2	18.3	43.6
Huron, Dak.	9.8	14.4	27.7	43.6	52.8	60.3	68.8	68.6	58.0	46.8	30.4	17.8	41.8
Yankton, Dak.	15.9	18.8	29.4	44.8	59.7	69.7	72.4	72.3	61.8	49.5	32.5	19.0	45.6
Extreme Northwest:													
Moorhead, Minn.	-2.7	5.6	16.8	37.8	53.3	64.8	66.4	66.2	55.4	42.6	23.6	9.7	36.6
Saint Vincent, Minn.	-6.8	1.5	12.7	33.5	51.2	62.1	63.4	63.4	52.4	39.6	19.3	4.5	33.2
Bismarck, Dak.	5.4	10.9	21.2	38.5	55.2	65.3	67.8	67.7	55.8	43.0	25.9	10.0	39.0
Burford, Fort, Dak.	5.1	10.2	22.1	39.2	53.7	64.3	66.5	66.7	53.7	41.4	24.9	8.0	38.1
Northern Slope:													
Assiniboine, Fort, Mont.	10.5	13.4	28.6	41.4	52.5	63.5	66.2	65.7	58.2	40.5	28.5	16.9	40.3
Benton, Fort, Mont.	16.0	19.4	33.4	41.8	53.2	63.2	68.8	68.6	55.5	41.8	30.3	19.9	42.6
Custer, Fort, Mont.	17.4	20.4	31.7	44.0	54.5	64.5	70.0	70.0	57.0	45.2	31.1	19.1	43.6
Siola, Mont.	15.0	19.7	33.4	41.4	51.6	61.1	66.0	67.2	56.0	42.2	29.6	20.4	42.6
Maginnis, Fort, Mont.	17.4	13.6	28.8	37.6	47.6	59.4	61.5	63.5	51.5	39.5	32.0	20.1	38.8
Poplar River, Mont.	2.2	-4.5	28.7	38.6	55.0	63.7	64.0	66.0	54.4	42.7	23.5	-2.0	36.3
Shaw, Fort, Mont.	17.3	19.7	32.3	39.5	49.9	59.7	63.2	63.3	53.4	40.7	30.7	21.5	41.2
Deadwood, Dak.	21.4	22.3	29.9	38.0	49.0	60.4	62.9	65.4	53.4	43.2	31.2	21.8	41.2
Cheyenne, Wyo.	24.9	25.3	32.8	39.8	49.3	60.7	65.7	64.3	55.5	43.5	32.9	27.7	43.5
North Platte, Nebr.	21.0	24.1	35.6	46.8	57.9	68.8	72.5	71.7	62.0	49.6	33.8	22.1	47.4
Middle Slope:													
Denver, Colo.	30.8	29.5	39.6	47.2	55.4	66.9	72.3	70.5	62.0	50.1	36.3	31.7	49.4
Pike's Peak, Colo.	1.8	8.4	7.2	13.0	21.8	33.6	39.7	38.1	30.7	20.5	10.0	6.7	18.9
West Las Animas, Colo.	21.9	26.9	40.9	48.4	57.2	68.9	75.1	72.1	66.4	52.3	36.9	20.9	49.2
Dodge City, Kans.	27.4	30.8	41.8	52.2	61.6	73.2	76.2	73.9	67.0	54.6	38.0	29.1	52.2
Elliot, Fort, Tex.	31.7	35.5	45.7	55.5	63.1	73.2	76.0	74.0	67.9	57.4	41.0	33.8	54.6
Southern Slope:													
Sill, Fort, Ind. T.	36.9	41.8	50.5	62.2	69.1	78.4	81.1	79.7	72.9	62.6	46.8	37.7	60.2
Concho, Fort, Tex.	42.8	48.3	56.9	64.0	71.2	79.9	81.7	79.7	72.9	64.8	51.2	46.1	63.1
Davis, Fort, Tex.	42.4	47.8	53.7	60.2	67.0	74.9	75.7	71.0	66.1	60.5	48.5	45.5	59.2
Stockton, Fort, Tex.	43.1	48.5	56.1	62.5	70.5	79.1	80.2	76.8	71.0	63.2	50.4	46.8	62.2
Southern Plateau:													
Santa Fe, N. Mex.	27.2	31.6	38.6	46.6	55.4	65.9	68.0	64.9	58.0	48.5	35.0	30.2	46.8
El Paso, Tex.	43.4	48.9	55.4	63.0	71.5	80.8	81.8	78.0	71.2	62.1	49.5	45.8	62.5
Apache, Fort, Ariz.	33.8	37.4	43.5	49.4	56.7	67.0	71.9	69.0	62.1	52.7	40.3	36.5	51.7
Grant, Fort, Ariz.	42.1	44.3	50.0	57.0	65.8	76.1	77.3	73.4	70.0	60.7	49.7	45.1	59.3
Prescott, Ariz.	34.5	36.0	42.5	49.1	57.0	66.4	71.4	69.1	62.1	51.7	40.9	37.6	51.5
Tucson, Camp, Ariz.	40.1	46.8	53.2	59.5	68.4	78.9	83.2	80.1	72.7	59.5	48.0	43.3	61.4
Yuma, Ariz.	52.8	56.3	62.5	68.3	76.3	84.5	91.4	90.1	82.9	69.9	56.7	55.4	70.8

Mean temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Middle Plateau:	°	°	°	°	°	°	°	°	°	°	°	°	°
Winnemucca, Nev	28.9	30.0	38.9	46.2	53.4	63.5	71.7	69.2	58.7	44.9	33.0	32.4	48.0
Salt Lake City, Utah	27.9	29.7	40.0	47.9	57.1	68.5	74.4	74.2	63.2	49.6	36.1	33.6	50.3
Northern Plateau:													
Boise City, Idaho	28.5	30.6	41.5	49.0	57.2	66.0	72.1	71.1	58.6	47.0	36.6	31.8	49.4
Lewiston, Idaho	31.6	30.4	43.2	50.8	58.6	66.9	72.8	72.0	59.7	49.0	38.0	31.3	50.4
Dayton, Wash.	30.9	29.1	42.4	48.9	55.9	63.9	67.4	66.7	56.2	48.1	37.4	30.5	48.2
Spokane Falls, Wash.	23.7	24.2	38.6	47.4	55.7	63.8	67.9	67.8	55.7	47.1	35.9	27.6	48.2
North Pacific Coast:													
Canby, Fort, Wash.	42.6	38.2	44.0	50.5	53.4	55.2	58.6	60.7	57.6	51.8	42.1	25.8	49.9
Olympia, Wash.	37.8	36.9	43.3	48.0	53.1	58.4	61.1	61.5	55.6	48.9	43.2	39.3	48.9
Tatoosh Island, Wash.	41.5	36.6	42.7	49.2	50.9	53.3	55.8	56.4	52.9	49.1	46.4	39.4	47.8
Portland, Oreg.	39.3	38.0	46.0	51.1	56.6	61.7	64.8	64.2	58.9	52.9	44.4	40.1	51.4
Roseburg, Oreg.	39.8	39.8	45.9	50.5	56.0	61.8	65.5	63.8	56.9	50.1	43.1	41.5	51.5
Middle Pacific Coast:													
Cape Mendocino, Cal.	46.6	44.6	48.6	47.8	51.0	54.6	53.8	55.0	57.2	53.3	51.3	49.0	51.3
Red Bluff, Cal.	45.3	47.0	53.7	57.9	66.8	74.9	82.3	79.3	72.2	60.2	53.7	46.6	61.6
Sacramento, Cal.	45.3	47.7	53.4	56.8	63.4	67.9	71.9	70.7	68.1	58.1	51.1	46.1	58.5
San Francisco, Cal.	49.3	49.7	52.5	53.9	57.0	57.9	58.8	58.1	50.2	57.4	54.2	51.2	55.0
South Pacific Coast:													
Los Angeles, Cal.	52.0	53.1	54.7	57.6	61.8	65.6	68.2	69.6	67.5	61.8	57.4	54.5	60.4
San Diego, Cal.	52.3	53.5	55.1	57.8	61.4	64.5	66.9	68.5	66.3	61.5	57.2	55.6	60.1
Alaska Stations:													
Saint Michael's, Fort, Alaska	5.3	1.6	10.8	19.0	33.2	46.2	53.7	52.5	43.5	31.8	19.0	4.4	26.7
Sitka, Alaska	37.0	32.7	37.0	42.7	46.6	51.2	53.8	55.8	51.9	46.1	42.2	35.2	43.9
Unalakha, Alaska	31.3	33.8	33.0	35.0	39.4	45.8	50.4	50.4	47.0	42.0	34.7	32.0	40.6
Behring's Island, Behring Sea	25.7	28.8	28.8	29.6	36.0	42.2	47.4	51.8	47.2	38.1	30.4	27.4	35.7

APPENDIX II.

Mean monthly temperature, and departure (of 1884) therefrom, in degrees Fahrenheit, at selected stations of the Signal Service, United States Army. (The normal has been computed for the decade ending December 31, 1884.)

[The daily means are obtained by dividing the sum of the three observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month. Observations from January 1, 1876, to November 1, 1876, taken at 7.35 a. m., 4.35 and 11 p. m., Washington time, and from November 1, 1876, to December 31, 1884, at 7 a. m., 3 and 11 p. m., Washington time.]

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.	Normal.	Departure + or -.
New England:																								
Eastport, Me.	19.0	-1.4	23.8	+1.9	28.5	-0.3	38.2	+1.7	47.2	-0.7	55.5	+1.9	60.4	-1.8	61.0	±0.0	55.8	+0.7	46.7	-1.3	36.0	+0.4	25.2	+1.1
Portland, Me.	23.6	-1.2	27.5	+2.2	33.5	-0.2	44.4	+1.3	55.4	-1.5	64.6	+2.2	69.9	-2.4	68.6	-1.1	61.3	+2.7	50.9	-0.3	38.4	-0.3	31.2	-0.5
Mount Washington, N. H.	4.4	+0.8	6.9	+7.2	11.2	+1.0	21.1	+4.3	32.9	-0.9	44.4	+4.6	47.0	-3.0	47.6	-0.7	41.0	+0.4	30.2	-1.8	17.5	-0.7	10.2	+1.7
Boston, Mass.	25.7	-1.9	28.5	+2.5	34.1	-0.6	43.7	-1.0	56.0	-2.2	65.9	-2.2	70.8	-2.8	69.1	-0.8	62.3	+3.5	51.7	-0.6	38.7	+1.4	30.4	+2.7
New Haven, Conn.	27.5	-4.3	30.4	+1.3	33.8	-2.2	46.3	-1.4	55.3	-2.4	67.8	-1.0	72.7	-4.9	70.8	-1.7	64.5	+1.9	53.8	-0.6	41.4	-0.5	31.9	-0.4
New London, Conn.	28.5	-2.4	30.9	+2.7	36.2	-0.4	45.6	-0.2	56.5	-0.7	65.8	-1.0	71.0	-3.5	70.0	-1.5	64.1	+2.8	54.3	+0.4	42.3	+0.6	32.8	+1.7
Middle Atlantic States:																								
Albany, N. Y.	22.7	+0.9	26.2	+6.8	33.0	+2.8	46.1	+1.7	59.5	-0.4	68.8	+3.7	72.6	-1.9	71.3	+1.3	63.4	+4.1	51.5	-0.2	39.2	-0.8	28.6	-0.8
New York City	29.6	-3.4	32.1	+3.0	37.0	+0.5	47.0	-0.6	59.1	-0.3	68.3	+0.4	73.4	-3.3	72.0	-0.5	66.0	+3.6	55.7	-0.4	43.2	+0.0	33.6	+1.0
Philadelphia, Pa.	31.2	-1.7	34.8	+5.5	39.8	-1.7	49.8	-1.1	62.1	-0.8	71.2	-0.7	75.8	-4.0	73.7	-1.2	67.3	+3.3	56.9	+0.3	44.4	+0.6	35.0	-0.4
Atlantic City, N. J.	31.6	-2.4	34.1	+3.5	38.5	+1.0	46.1	+0.3	57.1	+1.3	66.2	+0.2	72.2	-1.8	71.8	-0.7	66.7	+2.5	57.3	+1.2	44.1	+1.3	35.6	+1.9
Rarogat City, N. J.	30.9	-2.0	33.2	+4.6	38.0	+0.4	46.9	+0.3	57.4	+1.6	66.2	+0.2	72.2	-1.7	71.8	-0.7	66.7	+2.5	57.3	+1.2	44.1	+1.3	35.6	+1.9
Cape May, N. J.	34.1	-2.5	37.0	+2.5	41.1	-1.1	48.6	-0.6	56.3	+0.5	68.8	-0.8	74.4	-3.4	73.0	-1.3	67.3	+2.3	59.8	-0.5	47.7	+0.6	38.5	+1.1
Sandy Hook, N. J.	30.5	-2.8	32.8	+3.0	37.7	+2.0	46.9	+0.3	56.2	-0.3	68.8	-0.4	74.4	-3.4	73.0	-1.3	67.3	+2.3	59.8	-0.5	47.7	+0.6	38.5	+1.1
Baltimore, Md.	34.0	-2.0	37.7	+4.5	42.6	+1.4	52.8	-0.5	64.6	+0.2	73.6	-0.4	77.6	-3.0	75.0	-0.2	68.1	+3.6	57.7	+1.9	44.0	+0.4	37.4	+0.3
Washington City	32.6	-3.2	36.0	+4.0	41.8	+0.4	52.1	-1.2	64.2	+0.2	73.0	-0.5	77.6	-3.4	74.4	-0.2	68.1	+3.6	57.7	+1.9	44.0	+0.4	37.4	+0.3
Cape Henry, Va.	40.0	-3.7	43.2	+3.5	46.9	-0.1	54.1	-2.1	64.3	+0.9	73.1	-2.0	78.0	-3.0	76.4	-1.3	72.1	+1.7	63.2	+1.7	51.7	+1.5	43.4	+1.5
Lynchburg, Va.	37.2	-4.0	41.8	+3.8	46.9	-0.8	56.2	-2.1	67.0	+0.4	74.8	-3.2	79.6	-3.0	76.2	-1.4	69.5	+2.7	59.3	+2.5	47.0	-1.1	39.6	+0.5
Norfolk, Va.	40.3	-2.1	44.0	+6.1	48.4	+1.9	55.6	-1.1	66.5	+1.6	75.4	-2.0	79.8	-2.4	77.0	-1.0	71.4	+2.5	62.0	+1.3	50.6	+2.0	43.0	+2.3
South Atlantic States:																								
Wilmington, N. C.	47.1	-2.8	50.4	+6.1	54.9	+3.2	60.8	-0.3	68.8	+2.7	75.8	-1.9	80.0	-0.3	78.0	-1.1	73.4	+1.8	64.8	+3.7	54.4	+3.0	48.5	+1.7
Charleston, S. C.	51.0	-4.4	53.6	+5.1	58.3	+1.5	64.0	-0.7	72.6	+2.2	79.3	-3.7	83.2	-1.0	80.9	-2.1	76.4	+0.8	67.8	+3.7	57.7	+1.4	49.9	+2.8
Augusta, Ga.	48.2	-4.8	51.9	+4.6	57.2	+2.4	63.7	-1.7	72.6	+1.4	78.5	-4.3	82.7	-1.7	79.8	-0.7	75.0	+0.1	65.9	+4.7	54.5	+0.3	48.5	+2.3
Savannah, Ga.	52.7	-6.1	55.1	+3.2	60.3	+2.8	66.4	-1.1	73.8	+2.3	80.2	-4.0	83.7	-1.3	80.9	-2.3	76.2	+0.2	67.3	+2.5	58.4	+0.3	53.2	+1.2
Jacksonville, Fla.	55.4	-4.7	58.8	+3.3	63.5	+2.8	69.0	-0.3	75.2	+1.3	80.6	-3.7	83.1	-0.2	81.1	-1.3	77.9	+0.0	70.9	+1.9	62.1	-0.4	54.6	+1.8
Florida Peninsula:																								
Key West, Fla.	71.0	-2.7	71.8	+0.7	73.6	+1.0	76.5	-0.3	79.8	+1.1	83.2	-1.5	84.5	+0.5	84.3	-0.4	82.9	-0.7	79.4	-1.1	75.0	-0.1	70.6	+2.4
Eastern Gulf States:																								
Mobile, Ala.	51.4	-7.9	54.8	+2.5	60.5	+1.7	67.1	-0.9	74.6	+0.0	80.0	-3.1	82.4	-2.3	80.2	-1.5	76.8	+1.5	68.8	+3.4	58.3	-2.8	52.3	+1.6

Mean monthly temperature, and departure (of 1884) therefrom, in degrees Fahrenheit, at selected stations of the Signal Service, &c.—Continued.

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -
Eastern Gulf States—Continued.																								
Montgomery, Ala.	49.2	-3.7	52.9	+2.5	53.9	+1.9	55.0	-1.6	72.3	+1.3	79.5	-3.9	83.5	-1.5	79.9	-1.5	75.5	+3.5	64.9	+4.6	55.3	-1.3	49.6	+1.6
Vicksburg, Miss.	48.3	-7.2	53.0	+2.6	55.6	+0.4	55.6	-1.9	72.3	-1.4	79.5	-2.4	83.5	-1.5	79.9	-1.5	75.5	+3.5	64.9	+4.6	55.3	-1.3	49.6	+1.6
New Orleans, La.	55.2	-3.1	58.4	+2.3	63.4	+1.4	66.2	-1.0	75.4	+1.0	81.0	-2.4	83.5	-1.5	81.8	+0.5	78.0	+2.9	71.4	+3.0	61.3	-1.5	54.0	+2.7
Western Gulf States.																								
Shreveport, La.	46.4	-7.5	51.7	+2.0	50.3	+0.3	56.3	-2.5	72.6	-2.0	80.0	-1.3	83.5	-1.5	81.4	-0.6	74.8	+5.4	64.7	+1.3	54.4	-1.3	49.0	-2.3
Galveston, Tex.	53.1	-6.4	57.4	+2.4	62.3	+0.9	66.0	-2.4	74.5	-1.0	82.5	-1.1	84.5	-0.7	82.6	+0.7	78.4	+4.1	72.4	+4.1	62.1	+0.6	54.6	+1.0
Indianola, Tex.	57.7	-5.0	57.8	+2.4	64.3	+0.8	70.4	-2.9	76.4	-1.0	82.0	-1.8	83.9	-0.4	82.6	+0.7	79.3	+1.8	73.5	+0.5	62.1	+0.6	54.2	+2.3
Ohio Valley and Tennessee.																								
Knoxville, Tenn.	57.3	-7.4	43.6	+4.0	48.3	+0.8	57.0	-1.9	66.4	+0.4	72.9	-1.1	75.5	-1.7	74.2	-1.0	68.3	+3.6	59.6	+5.1	46.7	-0.4	39.5	+0.7
Memphis, Tenn.	40.3	-7.3	45.7	+2.1	52.4	+0.1	61.0	-2.1	70.6	-1.0	77.4	-1.9	81.3	+0.5	77.3	-0.5	71.4	+5.5	63.0	+3.3	49.9	+1.3	43.0	-1.7
Nashville, Tenn.	39.1	-9.0	43.9	+2.1	49.9	+0.8	56.5	-3.2	69.3	-1.0	76.3	-2.1	80.0	-1.9	77.3	-0.5	70.4	+3.9	61.7	+3.5	48.4	+0.3	41.1	-0.7
Louisville, Ky.	35.0	-7.5	39.8	+2.8	45.3	+1.4	54.2	-1.5	63.7	-0.9	74.0	-0.3	78.7	-2.3	75.8	-1.0	68.7	+5.0	59.4	+3.9	45.3	+1.8	38.4	-0.8
Indianapolis, Ind.	29.5	-7.9	34.4	+2.3	40.3	+0.8	52.5	-2.2	63.8	-1.7	71.3	-1.4	75.4	-3.7	72.6	-1.3	65.0	+5.6	54.1	+2.2	41.8	+0.3	33.2	-2.3
Cincinnati, Ohio	34.0	-7.3	38.7	+2.5	43.8	+1.4	54.5	-1.6	65.3	-1.6	73.4	-1.3	78.2	-1.6	75.0	+0.1	68.4	+5.2	53.6	+2.7	45.2	+0.7	37.3	-1.3
Pittsburg, Pa.	30.5	-5.6	33.9	+2.5	38.6	+1.6	50.1	-0.5	61.9	+0.5	70.4	+0.3	74.0	-2.4	71.0	-0.2	63.4	+5.0	55.2	+2.0	42.0	+0.7	34.0	+0.3
Lower Lakes.																								
Buffalo, N. Y.	23.7	-5.7	25.0	+1.3	30.0	-0.7	40.8	-1.1	53.3	-1.3	64.3	-3.3	69.4	-4.5	69.2	-1.7	62.3	+3.3	51.3	+2.8	33.3	-0.4	29.4	+0.4
Rochester, N. Y.	25.9	-4.0	27.5	+1.1	33.6	-0.8	44.3	-2.0	54.8	-1.5	64.3	-1.0	70.0	-2.5	70.4	-1.2	63.7	+1.6	53.0	+1.4	39.7	-2.3	35.4	+2.9
Dayton, Ohio	27.1	-5.4	28.0	+1.1	33.6	-0.8	44.3	-2.0	54.8	-1.5	64.3	-1.0	70.0	-2.5	70.4	-1.2	63.7	+1.6	53.0	+1.4	39.7	-2.3	35.4	+2.9
Cleveland, Ohio	25.8	-5.5	26.7	+1.0	32.0	-0.8	42.7	-1.2	52.9	-0.3	62.0	-1.5	71.3	-2.3	71.5	-0.5	63.7	+1.6	53.0	+1.4	39.7	-2.3	35.4	+2.9
Toledo, Ohio	27.4	-7.4	30.9	+1.0	36.0	+0.8	47.1	-2.2	60.3	-0.3	67.0	-1.5	73.9	-2.8	71.5	-0.5	63.7	+1.6	53.0	+1.4	39.7	-2.3	35.4	+2.9
Detroit, Mich.	24.5	-3.2	28.2	+2.4	33.3	+2.3	45.6	-0.1	53.1	+0.5	67.4	-1.2	71.8	-2.0	70.2	-0.6	63.4	+5.3	52.7	+3.6	39.1	+0.5	34.0	+0.5
Upper Lakes.																								
Albion, Mich.	18.2	-5.5	19.9	-3.7	24.1	-0.9	36.9	+0.4	49.0	-0.5	59.3	-2.1	65.7	-4.4	64.6	-2.6	57.3	+3.2	45.9	+2.4	32.7	-1.0	29.9	-0.7
Escanaba, Mich.	14.6	-3.9	16.5	-5.5	22.0	-1.0	34.3	+0.1	49.0	-0.7	60.3	-2.4	67.4	-4.9	66.1	-2.4	54.3	+4.3	44.3	+2.3	31.7	-1.4	29.0	-2.3
Grand Haven, Mich.	25.6	-1.7	27.1	-2.6	32.3	-0.2	44.3	-2.0	53.8	-0.7	64.3	-1.0	69.4	-2.5	68.1	-2.4	61.3	+4.1	51.5	+1.5	38.2	-0.9	33.6	-1.9
Marquette, Mich.	17.3	-3.4	19.7	-2.6	25.0	-2.3	37.6	-2.2	48.3	-0.8	58.3	-2.6	63.6	-3.6	62.0	-2.0	60.3	+3.0	49.3	+1.1	35.3	-1.1	33.6	-0.9
Fort Huron, Mich.	21.6	-0.9	24.2	-0.7	28.4	-0.5	40.9	-1.0	53.3	-0.6	63.6	-2.6	68.3	-3.6	67.9	-2.1	60.3	+3.0	49.3	+1.1	35.3	-1.1	33.6	-0.9
Chicago, Ill.	24.9	-2.7	25.6	-1.7	30.3	-1.9	43.9	-1.6	57.0	-0.3	65.0	-0.7	72.0	-3.8	71.5	-2.7	64.3	+4.7	54.4	+3.0	39.5	+0.1	34.8	-1.4
Milwaukee, Wis.	20.9	-0.4	24.3	-2.6	28.0	-2.9	42.6	-1.6	53.6	-0.1	62.0	-1.2	68.3	-3.6	68.5	-2.7	60.3	+3.2	50.1	+1.3	36.6	+0.1	32.6	-2.8
Duluth, Minn.	11.3	-3.9	16.4	-2.8	22.0	-2.9	36.5	-2.5	46.8	+0.1	57.9	-6.2	64.5	-4.1	63.8	-2.1	56.3	+1.3	45.0	+1.7	29.4	-0.3	17.3	-7.0
Upper Mississippi Valley.																								
Saint Paul, Minn.	12.9	-3.0	19.4	-2.6	23.9	-0.7	45.4	+1.0	58.5	+0.3	68.4	-3.8	71.6	-3.0	69.5	-0.9	61.9	+4.1	47.6	+4.2	31.1	+0.3	19.2	-4.4
La Crosse, Wis.	16.8	-2.4	23.6	-2.6	31.9	-2.4	47.7	-1.2	60.6	-0.1	68.1	-3.8	72.9	-2.4	70.4	-2.6	64.4	+4.9	50.7	+3.4	34.6	+0.6	19.2	-4.4
Davenport, Iowa	27.9	-2.1	29.3	-1.4	34.6	+0.3	49.9	+0.3	61.6	-0.4	69.3	-1.0	74.7	-3.9	72.6	-2.6	64.2	+5.0	53.0	+2.1	35.7	+2.1	28.1	-2.0
Des Moines, Iowa	19.0	-4.9	24.3	-2.0	31.4	-1.3	45.6	-1.3	58.3	-0.1	68.3	-3.4	73.6	-2.4	71.6	-2.6	64.2	+5.0	53.0	+2.1	35.7	+2.1	28.1	-2.0
Keokuk, Iowa	20.1	-6.4	31.2	-3.7	38.3	-0.9	52.1	-1.6	68.3	-0.9	77.1	-4.1	77.1	-2.3	74.6	-2.6	66.0	+4.4	53.1	+3.4	39.4	+1.3	28.2	-4.3

Calder, Ill.	36.0	-8.1	41.6	+0.4	47.9	-0.3	52.8	-3.6	57.9	-1.5	75.2	-1.5	79.5	-1.3	77.2	-1.9	69.6	+4.9	40.8	+2.5	47.0	+1.5	39.0	-2.8
Saint Louis, Mo.	31.9	-6.1	36.4	-0.9	42.9	+0.7	55.4	-3.0	65.3	-0.9	72.3	-0.5	78.4	-1.1	76.1	-1.7	68.8	+5.1	58.4	+2.3	45.5	+3.6	34.8	-2.0
Missouri Valley:																								
Leavenworth, Kans.	26.7	-5.6	32.3	-5.2	41.4	-0.1	54.0	-2.2	64.9	-2.6	72.9	-0.8	77.5	-0.2	75.7	-3.9	67.2	+4.5	55.2	+3.2	40.6	+2.5	31.4	-7.3
Omaha, Nebr.	31.1	-4.1	37.1	-7.7	53.6	-0.8	60.3	-2.8	69.4	-0.8	70.8	+1.5	76.0	-1.5	73.9	-3.6	64.4	+4.2	53.2	+4.1	39.7	+2.6	28.6	-5.3
Yankton, Dak.	18.1	-1.6	20.4	-8.3	29.7	+0.3	45.7	-3.2	56.0	+0.0	68.0	+3.7	72.8	-1.8	71.7	-2.7	61.2	+3.1	48.4	+4.5	31.9	+2.6	20.2	-8.4
Extreme Northwest:																								
Bismarck, Dak.	5.8	-1.6	11.4	-11.5	21.7	-2.0	39.9	-1.2	54.9	+0.5	61.8	+5.6	69.2	-4.9	67.8	-2.1	55.8	+0.1	43.1	+2.4	35.6	+3.2	18.1	-8.1
Northern Slope:																								
Cheyenne, Wyo.	23.9	-0.3	28.0	-4.3	33.0	-3.2	40.1	-3.9	50.2	-0.6	60.5	+0.6	66.8	-1.2	64.7	-3.6	55.6	+0.9	44.2	+3.4	32.8	+3.4	27.4	-8.6
North Platte, Nebr.	20.5	-1.1	26.4	-6.7	35.6	-1.6	47.0	-2.5	53.4	-0.5	63.2	+2.5	73.5	+0.1	72.0	-3.6	61.7	+3.2	49.4	+5.2	34.2	+3.4	24.7	-8.2
Middle Slope:																								
Denver, Colo.	37.2	+4.8	32.6	-2.7	40.0	-1.0	47.1	-3.5	54.4	-2.1	64.5	+0.5	72.4	+1.5	70.2	-2.3	61.5	+3.1	50.5	+5.0	37.1	+5.0	31.2	-6.6
Pike's Peak, Colo.	2.4	+0.0	4.0	-1.4	7.8	-2.9	13.0	-4.5	21.8	-1.4	32.5	-2.1	39.8	+0.0	38.5	-2.9	32.4	-0.4	21.9	+3.1	10.1	+3.2	6.1	-0.7
Dodge City, Kans.	24.6	-1.0	31.3	-4.8	42.1	-0.3	52.8	-3.7	63.0	-3.5	72.9	-1.7	77.3	-0.7	75.0	-3.1	67.2	+3.1	54.8	+2.8	38.8	+2.8	30.2	-9.2
Middle Plateau:																								
Salt Lake City, Utah	23.7	+0.4	32.9	-1.6	41.7	-1.1	48.8	-0.8	56.9	+0.8	67.8	+0.9	75.1	-1.7	74.7	-2.1	64.3	-5.5	51.4	+1.2	38.3	+3.8	32.7	+2.8
North Pacific Coast:																								
Portland, Oreg.	33.8	-0.1	41.2	-5.2	47.0	-1.6	51.8	+2.2	58.0	+3.8	62.1	+0.6	65.9	-2.4	65.2	+2.8	60.5	-4.8	52.8	-1.6	45.2	+1.5	41.2	-10.2
Middle Pacific Coast:																								
San Francisco, Cal.	50.2	-0.2	51.7	-1.7	53.7	+0.3	64.5	+0.5	66.6	+1.6	58.7	+0.3	58.6	+1.4	58.4	+0.3	59.7	-1.4	58.8	-1.9	55.4	+1.1	51.7	+0.8
South Pacific Coast:																								
San Diego, Cal.	53.6	+1.5	54.7	+1.2	55.9	+0.6	58.0	-0.4	61.2	+0.2	64.7	-0.3	67.2	+1.2	68.8	+0.7	66.7	-1.6	62.8	-1.5	58.1	+0.5	55.7	-1.3
Alaska Stations:																								
Saint Michael's, Fort, Alaska.	7.8	-4.7	-0.9	+13.8	9.1	+4.6	19.2	+3.8	32.9	+1.7	46.6	+0.8	53.7	-1.2	53.0	+3.7	43.9	-3.5	30.3	-7.9	16.3	+0.0	5.1	+8.1

APPENDIX 12.

Annual and mean annual temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army.

[The daily means are obtained by dividing the sum of the three telegraphic observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month; the annual, by dividing the sum of the monthly by 12. From August 25, 1872, to November 1, 1879, observations were taken at 7.35 a. m., 4.35 and 11 p. m., Washington time; and from November 1, 1879, to December 31, 1884, at 7 a. m., 8 and 11 p. m., Washington time.]

Stations.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	No. of years.	Mean annual.
New England:	o	o	o	o	o	o	o	o	o	o	o	o		o
Eastport, Me.....		41.1	38.6	40.8	42.6	43.0	40.6	42.3	42.1	41.5	40.6	41.5	11	41.3
Portland, Me.....	43.7	44.9	44.1	48.0	48.3	49.1	47.1	48.7	48.4	48.0	46.4	47.6	12	47.0
Mt. Washington, N. H.....	25.4	25.8	23.5	25.9	27.8	28.0	25.8	27.6	27.6	25.6	24.3	27.4	12	26.2
Boston, Mass.....	48.3	48.7	46.2	47.3	49.2	49.2	47.8	49.4	48.5	48.1	47.6	48.3	12	48.2
Block Island, R. I.....										50.3	50.0	48.8	4	49.6
New Haven, Conn.....	47.8	49.2	48.2	50.7	52.4	52.9	50.7	51.6	49.8	48.7	47.5	48.8	12	49.9
New London, Conn.....	47.4	49.1	47.3	49.5	51.0	51.3	49.7	50.8	50.3	49.8	48.9	49.7	12	49.6
Middle Atlantic States:														
Albany, N. Y.....		46.3	43.6	47.0	48.1	48.7	46.4	50.4	51.4	51.0	49.2	50.0	11	48.4
New York City.....	50.2	51.4	48.6	50.5	52.6	52.9	51.3	52.2	52.2	51.5	50.6	51.6	12	51.3
Philadelphia, Pa.....	51.5	52.6	50.1	52.5	53.9	54.0	53.4	54.5	54.2	54.0	53.6	53.5	12	53.2
Atlantic City, N. J.....		51.0	49.2	51.1	52.5	53.0	51.5	53.3	52.7	52.6	51.4	52.6	11	52.0
Barnegat City, N. J.....		51.0	48.8	51.0	52.1	52.4	50.7	52.4	51.6	52.0	51.6	52.6	11	51.5
Cape May, N. J.....	51.7	52.2	50.2	53.6	54.8	56.0	54.2	55.6	54.7	55.2	53.8	54.8	12	53.9
Sandy Hook, N. J.....		49.8	49.1	51.9	53.3	53.4	51.6	53.5	53.3	52.7	51.6	52.2	11	52.0
Del. Breakwater, Del.....									54.4	54.0	53.8	54.1	4	54.0
Baltimore, Md.....	54.8	55.5	53.1	54.9	56.8	56.9	55.0	56.4	57.1	55.7	55.1	56.2	12	55.6
Washington City.....	54.8	55.9	52.2	54.4	55.5	56.0	55.1	55.0	55.9	54.9	54.0	55.1	12	55.0
Cape Henry, Va.....		59.1	57.6	58.4	58.8	59.6	58.8	60.6	59.5	58.9	58.3	58.7	11	58.9
Chincoteague, Va.....									54.7	55.2	54.6	55.6	4	55.0
Lynchburg, Va.....	55.0	56.6	55.3	57.1	59.2	58.7	58.4	58.2	59.8	57.7	57.5	57.6	12	57.6
Norfolk, Va.....	58.1	58.7	57.6	59.0	58.9	59.8	58.2	60.5	59.9	59.8	59.9	60.4	12	59.3
South Atlantic States:														
Charlotte, N. C.....							60.4	60.8	61.4	60.4	60.5	60.5	6	60.6
Hatteras, N. C.....									61.9	61.7	61.2	62.2	4	61.8
Kitty Hawk, N. C.....				59.3	59.3	60.1	59.3	61.3	59.7	59.5	59.5	60.4	9	59.8
Macon, Fort. N. C.....									62.4	62.4	61.9	62.7	4	62.4
Smithville, N. C.....				63.1	63.2	63.7	63.1	65.0	63.4	63.2	63.1	63.8	9	63.5
Wilmington, N. C.....	63.0	63.6	61.5	61.6	62.4	62.2	62.6	63.0	64.2	64.2	64.0	64.8	12	63.1
Charleston, S. C.....	64.6	65.7	64.8	65.5	66.1	66.5	66.7	67.2	66.8	67.1	66.6	66.7	12	66.2
Augusta, Ga.....	62.9	64.4	63.3	63.4	64.8	65.2	65.2	65.4	65.7	65.3	65.8	65.2	12	64.7
Savannah, Ga.....	65.0	66.5	65.8	66.6	67.0	67.8	67.4	68.0	67.8	68.1	68.3	67.1	12	67.1
Jacksonville, Fla.....	68.2	69.8	68.8	68.4	69.1	69.3	69.3	70.2	70.2	70.4	70.6	69.6	12	69.5
Florida Peninsula:														
Cedar Keys, Fla.....								70.9	70.5	71.1	72.4	70.7	5	71.1
Key West, Fla.....	77.0	77.8	78.1	77.0	77.0	77.1	77.1	78.7	78.1	78.2	78.4	77.6	12	77.7
Eastern Gulf States:														
Atlanta, Ga.....							61.5	62.1	62.0	61.8	61.5	61.1	6	61.7
Pensacola, Fla.....								63.3	63.3	63.4	63.0	67.8	5	63.4
Mobile, Ala.....	66.0	67.9	66.7	66.0	66.8	67.3	67.0	(¹)	68.0	68.2	68.9	66.7	11	67.2
Montgomery, Ala.....	64.2	66.1	65.2	64.6	65.3	65.8	65.6	65.1	66.0	66.7	66.4	65.4	12	65.6
Vicksburg, Miss.....	65.8	66.0	64.0	64.3	64.0	66.0	66.3	65.2	66.8	66.9	66.4	65.5	12	65.7
New Orleans, La.....	68.0	69.9	68.8	68.4	68.3	68.9	68.8	69.4	69.7	70.8	71.1	69.8	12	69.4
Western Gulf States:														
Shreveport, La.....	64.5	68.0	65.2	64.7	64.8	65.6	66.9	65.6	66.4	66.2	65.8	65.1	12	65.7
Fort Smith, Ark.....											59.7	59.3	2	59.5
Little Rock, Ark.....								61.9	63.0	62.9	62.1	61.4	5	62.3
Galveston, Tex.....	60.3	70.5	69.8	70.1	69.0	70.0	70.8	69.8	70.1	71.5	70.6	70.3	12	70.3
Indianola, Tex.....	69.6	70.6	69.4	69.7	69.4	70.7	71.1	69.5	70.1	71.8	70.3	69.4	12	70.1
Palestine, Tex.....											65.7	64.4	2	65.0
Rio Grande Valley:														
Brownsville, Tex.....						72.7	78.7	72.6	72.5	73.8	72.7	71.6	7	72.8
Rio Grande City, Tex.....							74.2	72.8	73.6	(¹)	(¹)	73.5	4	73.4
Ohio Valley and Tennessee:														
Chattanooga, Tenn.....							60.7	60.3	60.8	60.4	60.9	59.6	6	60.4

¹ Record incomplete.

² No record.

Annual and mean annual temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army—Continued.

Stations.	1872.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	No. of years.	Mean annual.
Ohio Valley and Tennessee—Continued:	°	°	°	°	°	°	°	°	°	°	°	°		°
Knoxville, Tenn.	56.5	57.8	56.5	55.7	57.0	57.6	58.8	58.5	58.7	58.2	57.9	57.5	12	57.5
Memphis, Tenn.	59.6	62.4	59.4	60.1	60.9	61.9	61.6	61.0	62.5	62.5	61.4	61.1	12	61.2
Nashville, Tenn.	59.1	61.5	58.4	58.9	59.5	60.0	60.5	60.2	61.2	60.8	59.1	58.7	12	59.8
Louisville, Ky.	55.7	57.8	54.5	56.2	57.5	57.8	57.2	57.4	58.2	57.9	56.4	57.1	12	57.0
Indianapolis, Ind.	51.9	54.6	50.2	52.9	54.8	55.0	53.8	53.9	54.7	53.6	51.8	52.5	12	53.3
Cincinnati, Ohio.	55.6	57.0	53.0	55.2	56.2	57.0	56.2	56.8	57.7	56.9	55.3	56.0	12	56.0
Columbus, Ohio.	.....	.....	.....	.....	.....	.....	52.3	53.5	53.7	52.7	51.1	52.2	6	52.7
Pittsburg, Pa.	50.4	51.7	48.8	51.5	52.8	52.8	52.1	53.4	54.0	52.8	51.9	53.2	13	52.1
Lower Lakes:														
Buffalo, N. Y.	46.0	46.2	42.7	45.8	47.8	48.8	46.4	47.5	47.8	47.0	44.9	45.8	12	46.4
Oswego, N. Y.	46.3	46.9	44.2	47.2	49.0	51.2	48.3	49.1	48.2	47.9	45.5	46.1	12	47.5
Rochester, N. Y.	45.1	46.7	43.9	46.8	48.6	49.6	47.4	48.7	48.6	46.7	(¹)	46.0	11	47.1
Erie, Pa.	.....	50.1	46.4	49.0	50.3	51.8	49.7	50.0	50.0	49.5	47.5	48.8	11	49.4
Cleveland, Ohio.	48.6	50.5	45.9	48.0	50.0	50.5	49.1	50.0	49.8	49.4	47.3	48.4	12	49.0
Sandusky, Ohio.	.....	.....	.....	.....	.....	52.0	50.8	51.4	51.3	50.7	(¹)	49.9	6	51.0
Toledo, Ohio.	46.8	49.8	46.7	50.2	52.1	52.8	51.2	51.9	51.8	51.5	48.9	49.9	12	50.5
Detroit, Mich.	49.2	48.8	44.1	47.2	49.0	49.6	48.0	48.7	51.2	51.2	47.7	49.7	12	48.4
Upper Lakes:														
Alpena, Mich.	39.7	41.2	37.2	40.9	43.8	45.0	41.3	42.2	42.1	42.7	38.7	40.4	12	41.2
Escanaba, Mich.	39.2	40.4	36.1	39.8	42.5	44.6	40.9	41.8	41.1	42.8	37.0	39.2	12	40.5
Grand Haven, Mich.	45.2	47.5	43.3	46.9	48.9	50.1	47.8	48.3	48.1	48.2	44.7	46.9	12	47.2
MacKinaw City, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39.3	40.7	2	40.0
Marquette, Mich.	39.2	41.2	37.0	40.8	44.4	46.5	42.5	42.0	41.0	42.3	38.1	39.0	12	41.2
Port Huron, Mich.	.....	.....	41.7	44.9	46.3	47.9	45.3	46.9	45.8	45.7	42.7	44.4	10	45.3
Chicago, Ill.	47.2	50.4	45.4	49.0	50.3	51.4	49.9	50.8	49.4	49.6	46.3	48.2	12	49.0
Milwaukee, Wis.	43.9	45.0	40.8	43.9	45.8	48.5	46.2	46.7	46.3	47.1	43.4	43.9	12	45.1
Duluth, Minn.	39.3	39.8	36.8	37.9	43.5	45.3	40.0	38.7	40.4	41.2	38.0	37.3	12	39.8
Upper Mississippi Valley:														
Saint Paul, Minn.	41.6	43.3	39.8	42.3	47.5	48.2	45.5	44.0	45.2	45.6	40.9	43.7	12	44.0
La Crosse, Wis.	43.5	47.5	43.1	45.5	48.8	50.9	47.6	46.9	48.0	48.7	43.9	45.5	12	49.8
Davenport, Iowa.	49.0	49.6	45.4	48.8	50.8	52.2	50.0	51.0	50.4	51.7	48.3	49.8	12	49.8
Des Moines, Iowa.	.....	.....	.....	.....	.....	.....	49.8	49.8	49.8	49.8	46.1	47.5	6	48.7
Dubuque, Iowa.	.....	48.9	44.8	47.6	49.6	50.0	48.6	48.6	48.6	49.0	45.5	47.1	11	48.1
Keokuk, Iowa.	50.8	52.6	48.5	51.0	52.9	55.0	52.9	53.5	52.6	52.6	49.8	50.7	12	51.9
Cairo, Ill.	56.8	58.4	55.7	57.1	58.5	60.1	59.6	59.0	59.6	59.2	57.4	57.4	12	58.2
Springfield, Ill.	.....	.....	.....	.....	.....	.....	.....	54.1	53.8	53.9	51.0	52.3	5	53.0
Saint Louis, Mo.	53.7	56.3	53.9	55.4	56.4	57.4	55.7	55.1	55.9	55.6	53.6	55.8	12	55.4
Missouri Valley:														
Leavenworth, Kans.	51.7	54.2	51.0	53.2	53.8	55.4	54.5	54.1	54.1	54.7	51.7	51.9	12	53.4
Omaha, Nebr.	48.6	50.0	46.3	48.6	50.9	52.5	51.5	50.8	49.7	51.4	47.8	48.4	12	49.7
Bennett, Fort, Dak.	.....	.....	.....	.....	.....	.....	.....	.....	43.8	45.7	42.2	42.5	4	43.6
Huron, Dak.	.....	.....	.....	.....	.....	.....	.....	.....	.....	43.8	40.7	40.8	3	41.8
Yankton, Dak.	.....	46.7	41.2	43.5	46.7	48.2	47.3	46.5	45.4	47.4	44.0	44.6	11	45.6
Extreme Northwest:														
Moorhead, Minn.	.....	.....	.....	.....	.....	.....	.....	.....	37.9	38.6	34.0	35.9	4	36.6
Saint Vincent, Minn.	.....	.....	.....	.....	.....	.....	.....	.....	35.5	34.4	30.3	32.5	4	33.2
Bismarck, Dak.	.....	.....	35.0	36.3	42.4	44.8	39.5	38.4	40.1	41.1	37.7	37.8	10	39.4
Burford, Fort, Dak.	.....	.....	.....	.....	.....	.....	39.0	38.6	39.4	41.0	36.2	37.4	6	38.3
Northern Slope:														
Aassinaboine, Ft., Mont.	.....	.....	.....	.....	.....	.....	.....	.....	.....	42.7	39.2	39.1	3	40.8
Benton, Fort, Mont.	42.5	43.3	42.1	(¹)	(²)	(³)	(⁴)	40.8	43.6	44.8	43.0	41.5	8	42.6
Custer, Fort, Mont.	.....	.....	.....	.....	.....	.....	.....	43.0	45.3	45.2	(¹)	40.9	4	43.6
Helena, Mont.	.....	.....	.....	.....	.....	.....	.....	.....	43.8	43.8	42.7	40.2	4	42.6
Maginnis, Fort, Mont.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39.5	38.1	2	38.8
Shaw, Fort, Mont.	.....	.....	.....	.....	.....	.....	.....	.....	42.1	42.5	40.6	39.8	4	41.2
Deadwood, Dak.	.....	.....	.....	.....	.....	.....	.....	40.8	(¹)	42.9	40.5	40.5	4	41.2
Cheyenne, Wyo.	44.8	45.5	42.5	44.3	44.2	44.2	46.5	42.9	45.8	43.9	42.4	42.6	12	44.1
North Platte, Nebr.	.....	.....	46.3	47.5	48.2	49.7	48.1	47.1	47.9	49.1	45.9	46.8	10	47.7
Middle Slope:														
Denver, Colo.	48.1	49.8	48.6	49.5	48.8	49.5	50.8	47.4	50.8	50.3	48.8	49.5	12	49.3
Pike's Peak, Colo.	.....	18.9	18.2	19.0	18.4	19.4	21.9	17.9	20.7	18.8	18.7	18.3	11	19.1
West Las Animas, Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49.6	48.7	2	49.2
Dodge City, Kans.	.....	.....	52.4	53.2	53.2	54.4	54.3	52.0	53.0	53.6	51.0	51.2	10	52.8
Elliott, Fort, Tex.	.....	.....	.....	.....	.....	.....	.....	54.4	54.9	54.8	54.3	54.5	5	54.6
Southern Slope:														
Still, Fort, Ind. T.	.....	.....	.....	.....	50.5	61.6	62.0	59.4	61.2	60.0	(¹)	(¹)	6	60.6
Concho, Fort, Tex.	.....	.....	.....	.....	63.7	64.8	62.3	63.9	63.5	63.3	62.5	62.5	7	63.6
Davis, Fort, Tex.	.....	.....	.....	.....	.....	62.0	62.0	(¹)	59.3	59.9	59.9	59.6	5	59.8
Stockton, Fort, Tex.	.....	.....	.....	.....	62.9	65.7	61.8	62.7	61.6	62.3	63.1	62.8	7	62.8
Southern Plateau:														
Santa Fe, N. Mex.	48.6	48.0	48.0	47.5	47.6	47.5	50.2	45.4	(¹)	48.3	(¹)	(¹)	9	47.9
El Paso, Tex.	.....	.....	.....	.....	.....	.....	60.3	62.0	61.6	62.6	62.6	62.5	6	63.2
Apache, Fort, Ariz.	.....	.....	.....	.....	.....	.....	53.4	50.8	52.4	51.3	52.2	51.9	6	52.0

¹ Record incomplete.² No record.

Annual and mean annual temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army—Continued.

Stations.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	No. of years.	Mean annual.
Southern Plateau—Cont'd.	°	°	°	°	°	°	°	°	°	°	°	°		°
Grant, Fort, Ariz							63.2	59.1	59.8	58.6	59.0	60.0	6	60.0
Prescott, Ariz						52.8	54.7	50.6	52.5	51.1	52.5	50.8	7	52.1
Thomas, Camp, Ariz									60.7	61.3	61.9	61.6	4	61.4
Yuma, Ariz				74.0	73.7	72.0	73.3	70.2	71.9	70.8	(¹)	70.4	8	72.0
Middle Plateau:														
Winnemucca, Nev.						49.8	50.0	(¹)	49.2	46.8	(¹)	(¹)	4	49.0
Salt Lake City, Utah ..			52.4	51.2	51.4	51.9	53.0	48.6	51.8	49.2	50.8	50.9	10	51.1
Northern Plateau:														
Boisé City, Idaho						52.4	51.4	48.9	50.0	48.6	(¹)	50.0	6	50.2
Lewiston, Idaho								49.5	51.1	51.6	50.8	49.4	5	50.4
Dayton, Wash								47.9	49.3	48.6	48.1	47.2	5	48.2
Spokane Falls, Wash ..										46.5	46.8	45.4	2	46.2
North Pacific Coast:														
Olympia, Wash						50.8	49.0	47.7	49.7	48.9	49.0	48.4	7	49.2
Portland, Oreg	52.6	53.6	53.3	53.1	53.9	53.3	52.4	50.4	52.2	51.5	51.7	51.1	13	52.4
Roseburg, Oreg						53.1	52.2	50.6	52.2	51.5	51.8	(¹)	6	51.9
Middle Pacific Coast:														
Cape Mendocino, Cal ..											50.6	51.8	2	51.2
Red Bluff, Cal						64.0	64.2	61.8	62.1	(¹)	61.5	60.2	6	62.4
Sacramento, Cal						61.3	60.3	57.2	59.2	58.5	58.8	58.2	7	59.2
San Francisco, Cal	55.9	55.7	55.6	56.3	57.3	56.5	56.1	54.2	55.8	54.4	54.7	55.8	12	56.7
South Pacific Coast:														
Los Angeles, Cal						60.7	60.6	58.4	61.1	60.1	61.6	60.2	7	60.5
San Diego, Cal	60.6	59.6	61.6	61.0	62.1	60.6	60.1	58.5	60.4	59.8	61.2	60.7	12	60.5
Alaska Stations:														
Saint Michael's, Fort, Alaska			24.2	24.3	25.2	25.6	26.4	23.2	23.3	26.1	23.2	27.8	10	26.1
Sitka, Alaska										43.2	44.3	44.2	3	43.9
Behring's Island, Beh- ring Sea											35.5	35.9	2	35.7

¹ Record incomplete.

² No record.

APPENDIX 13.

Mean daily range of temperature (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month of the year 1884. The daily range is the difference between the highest and lowest temperature, as recorded by self-registering thermometers.

[The mean daily is obtained by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
New England:	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me.	14.9	14.8	12.8	10.4	14.0	17.9	14.1	15.1	18.9	12.5	13.0	14.0
Portland, Me.	16.1	15.4	15.5	14.2	15.8	18.3	15.9	14.5	16.5	15.3	14.0	12.8
Mount Washington, N. H.	19.6	21.4	17.4	12.5	12.5	18.8	10.8	12.4	12.0	15.2	16.0	16.9
Boston, Mass.	15.7	16.0	16.0	14.1	18.7	21.3	17.3	15.8	19.5	17.7	17.5	15.1
Block Island, R. I.	13.9	14.6	12.4	10.9	12.9	13.3	10.9	9.4	11.8	12.2	14.4	12.7
New Haven, Conn.	16.8	14.5	15.7	16.9	18.6	22.8	16.0	16.4	20.2	18.7	18.5	16.0
New London, Conn.	13.8	14.3	14.0	15.3	18.5	18.2	13.8	13.5	16.2	15.9	16.8	13.6
Middle Atlantic States:												
Albany, N. Y.	16.3	13.3	11.5	13.9	16.1	20.0	15.6	16.9	16.5	17.8	14.9	14.7
New York City.	13.2	14.5	13.8	16.0	16.7	18.8	15.6	14.6	17.3	16.6	15.2	13.2
Philadelphia, Pa.	12.4	14.7	12.9	16.5	17.9	21.5	17.0	16.2	19.2	18.7	17.0	13.0
Atlantic City, N. J.	14.1	11.9	12.6	14.2	15.2	12.6	14.1	11.4	12.7	15.0	17.3	12.9
Barnegat City, N. J.	14.0	12.5	(°)	13.1	14.9	13.9	14.5	11.5	13.9	15.9	17.2	14.8
Cape May, N. J.	13.6	12.7	11.5	12.3	13.2	13.7	11.3	10.8	11.5	13.8	15.0	12.9
Sandy Hook, N. J.	12.4	12.7	11.8	12.8	14.8	14.3	12.6	11.8	16.1	15.3	14.0	12.7
Delaware Break- water, Del.	12.4	13.9	12.4	10.9	13.0	12.0	11.9	9.3	13.4	13.2	13.4	11.4
Baltimore, Md.	13.9	13.8	12.8	14.7	15.9	17.4	15.8	14.5	17.9	16.9	16.0	12.5
Washington City.	14.6	16.3	14.9	18.1	20.6	21.4	18.7	18.3	21.7	20.0	19.8	13.6
Cape Henry, Va.	16.1	16.7	15.8	14.5	15.4	14.6	13.8	12.6	14.6	14.5	15.4	14.8
Chincoteague, Va.	14.0	13.9	12.6	13.9	16.5	16.3	14.0	11.6	15.2	16.0	16.0	13.9
Lynchburg, Va.	15.7	17.3	17.3	17.8	19.6	18.3	19.1	19.0	21.8	21.4	20.7	15.5
Norfolk, Va.	16.4	18.0	16.0	14.9	18.1	17.2	15.0	12.1	15.8	16.5	15.8	14.3
South Atlantic States:												
Charlotte, N. C.	16.3	18.1	17.4	18.0	18.6	15.9	18.2	18.1	17.5	19.8	19.2	16.6
Hatteras, N. C.	15.6	16.2	13.6	11.8	11.8	10.7	9.6	8.1	10.4	10.7	11.5	13.2
Kitty Hawk, N. C.	14.5	17.5	15.8	12.4	16.2	18.1	13.9	9.7	11.8	13.9	12.6	14.0
Macon, Fort, N. C.	14.8	14.1	12.3	13.0	10.6	10.8	9.1	8.6	9.8	11.7	13.8	14.3
Smithville, N. C.	16.7	14.2	13.0	15.0	13.3	13.9	11.6	11.7	12.3	15.1	18.1	16.0
Wilmington, N. C.	17.9	18.4	16.6	17.5	16.3	15.9	14.1	14.0	16.4	18.1	19.5	13.2
Charleston, S. C.	16.2	15.0	14.0	14.6	13.2	11.9	12.0	12.6	11.6	12.6	15.4	14.0
Augusta, Ga.	17.7	21.5	18.3	19.2	19.0	15.1	17.0	17.4	17.1	20.4	23.8	18.5
Savannah, Ga.	16.9	16.9	15.1	16.0	15.8	13.0	13.8	12.3	12.6	14.9	17.7	17.0
Jacksonville, Fla.	18.0	17.3	16.5	16.5	15.9	14.3	14.7	15.7	14.1	15.1	16.4	14.5
Florida Peninsula:												
Cedar Key, Fla.	15.2	12.5	12.2	12.3	12.3	13.4	11.0	13.8	12.4	14.9	14.9	11.5
Key West, Fla.	9.2	9.2	10.6	10.4	12.2	12.0	11.9	12.7	10.3	7.2	6.0	7.7
Sanford, Fla.	13.9	13.6	13.9	20.2	21.0	18.4	18.7	17.8	17.2	18.3	20.1	20.2
Eastern Gulf States:												
Atlanta, Ga.	18.1	17.2	15.8	16.3	16.8	14.2	14.2	15.6	17.6	18.1	18.6	15.8
Pensacola, Fla.	19.0	15.7	13.8	14.6	13.8	13.1	12.7	14.9	13.0	14.7	19.2	15.1
Mobile, Ala.	18.4	16.5	16.6	18.0	18.7	13.9	16.1	17.7	16.5	18.9	22.5	17.6
Montgomery, Ala.	18.4	19.7	18.1	18.8	19.9	17.0	18.1	19.4	20.9	21.7	24.0	18.7
Vicksburg, Miss.	17.9	18.6	16.1	18.8	18.4	18.9	19.1	20.8	19.6	19.2	21.3	17.9
New Orleans, La.	18.3	18.2	14.1	13.5	12.5	11.8	12.8	13.7	13.0	13.1	14.5	13.7
Western Gulf States:												
Shreveport, La.	18.2	18.6	20.0	20.8	18.6	21.2	21.9	21.7	20.8	24.4	22.3	19.0
Fort Smith, Ark.	22.0	20.2	22.1	21.2	22.3	22.6	24.6	22.1	23.9	24.3	22.6	17.1
Little Rock, Ark.	16.7	18.3	17.5	17.6	18.0	19.1	20.3	20.4	19.0	18.5	19.7	14.9
Galveston, Tex.	16.8	11.9	10.7	10.3	10.6	10.8	10.1	10.3	8.8	10.0	11.4	14.5
Indianola, Tex.	17.3	15.5	13.4	13.3	13.7	12.9	13.5	12.6	10.2	10.8	11.0	16.9
Palestine, Tex.	19.4	19.9	19.3	18.3	17.5	18.8	19.6	21.1	19.5	18.2	19.5	20.8
Rio Grande Valley:												
Brownsville, Tex.	19.6	18.9	17.6	18.6	17.2	17.0	15.1	17.7	15.1	14.5	16.1	17.8
Rio Grande City, Tex.	23.3	24.7	23.2	23.8	23.1	25.9	27.9	28.9	20.3	17.1	16.4	18.5

° 30 days.

° 20 days.

° No record.

° 26 days.

° 28 days.

° 27 days.

Mean daily range of temperature at stations of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Ohio Valley and Tennessee:	°	°	°	°	°	°	°	°	°	°	°	°
Chattanooga, Tenn.	17.5	15.7	17.0	17.5	19.4	18.0	17.0	17.9	19.0	19.3	21.0	17.3
Knoxville, Tenn.	18.5	16.9	18.8	19.4	21.0	18.7	18.3	20.3	22.0	23.4	23.1	17.6
Memphis, Tenn.	16.2	17.5	16.0	16.2	17.2	15.3	16.8	16.6	17.1	17.6	18.6	15.9
Nashville, Tenn.	18.0	16.9	15.3	17.2	17.7	15.4	17.1	19.5	19.6	20.0	22.0	18.2
Louisville, Ky.	16.6	17.7	14.3	15.1	17.4	15.4	16.3	18.2	18.6	17.7	17.2	15.3
Indianapolis, Ind.	15.3	15.7	15.1	15.9	17.2	16.5	17.1	18.5	17.0	16.6	16.8	14.5
Cincinnati, Ohio.	15.1	16.2	12.7	13.8	14.4	14.2	13.9	15.4	14.7	15.9	16.8	15.7
Columbus, Ohio.	15.5	15.4	14.4	17.7	18.4	19.5	18.0	19.9	19.3	17.3	17.5	16.2
Pittsburg, Pa.	17.5	20.0	16.6	18.8	22.9	24.0	23.0	23.2	23.0	22.3	19.3	17.3
Lower Lakes:												
Buffalo, N. Y.	14.6	17.8	14.4	15.2	16.0	17.4	13.1	15.4	14.2	14.6	12.1	11.7
Oswego, N. Y.	15.6	16.1	12.6	12.0	18.8	19.4	15.1	18.2	18.8	18.9	15.5	14.1
Rochester, N. Y.	14.5	17.0	13.8	14.3	18.1	20.1	15.5	19.2	20.5	18.0	15.7	15.8
Erie, Pa.	15.5	17.3	(¹)	15.0	18.5	17.5	14.0	16.2	15.0	15.0	14.3	12.0
Cleveland, Ohio	16.5	16.7	14.9	15.1	17.2	17.1	14.1	17.1	16.9	17.4	15.9	14.6
Sandusky, Ohio	14.0	14.6	12.8	12.8	17.5	15.2	15.2	14.4	15.0	14.8	14.3	12.7
Toledo, Ohio	16.7	14.2	14.7	15.1	17.7	16.4	16.2	17.1	16.5	17.5	16.7	13.4
Detroit, Mich.	14.8	16.1	14.9	18.1	18.8	20.2	18.8	18.2	16.4	17.8	14.3	13.5
Upper Lakes:												
Alpena, Mich.	15.2	15.4	17.5	14.9	17.1	18.0	17.9	17.1	19.0	16.6	12.6	13.6
Escanaba, Mich.	18.6	19.4	22.7	10.5	16.5	18.2	17.6	15.8	14.2	15.2	15.1	12.9
Grand Haven, Mich.	15.2	14.3	15.0	15.2	14.8	16.2	12.5	13.5	14.4	13.3	14.0	11.6
Mackinaw City, Mich.	16.7	17.9	19.0	15.3	15.0	16.9	14.7	15.8	16.3	13.7	11.6	10.6
Marquette, Mich.	20.0	23.2	22.9	17.6	16.9	23.0	16.4	19.1	17.7	18.6	15.6	15.4
Port Huron, Mich.	16.5	15.5	14.5	13.7	17.8	19.0	17.5	16.8	16.3	17.6	14.6	13.4
Chicago, Ill.	15.4	15.1	13.8	12.8	15.6	13.8	13.3	13.2	13.5	15.6	15.6	13.6
Milwaukee, Wis.	15.9	16.3	13.9	12.4	17.5	16.3	15.4	14.9	14.7	15.3	15.5	14.2
Duluth, Minn.	21.6	17.6	18.7	10.4	17.5	14.9	14.1	13.3	12.4	14.4	15.7	14.8
Upper Mississippi Valley:												
Saint Paul, Minn.	23.8	22.8	19.2	18.4	21.0	20.1	20.3	19.9	18.4	18.0	17.4	15.7
La Crosse, Wis.	18.0	17.3	15.3	16.3	15.4	15.6	14.3	15.4	15.4	14.7	15.6	12.8
Davenport, Iowa	22.0	22.5	21.9	23.0	21.7	21.0	21.0	20.8	16.0	15.9	17.2	14.0
Des Moines, Iowa.	20.4	20.0	17.2	18.6	21.3	19.9	20.8	18.7	19.3	19.0	18.4	13.3
Dubuque, Iowa.	18.5	18.6	16.8	21.5	21.3	21.2	22.1	21.2	19.8	17.3	19.5	15.4
Keokuk, Iowa.	16.9	16.9	16.2	17.7	19.5	18.4	18.8	20.1	18.4	18.6	17.8	13.1
Cairo, Ill.	18.2	15.6	13.5	14.4	15.1	13.5	15.0	16.2	15.2	16.8	16.5	13.4
Springfield, Ill.	16.8	16.8	15.0	15.9	18.3	17.4	16.4	17.9	17.9	18.7	17.4	14.5
Saint Louis, Mo.	17.8	17.7	15.1	16.1	17.0	15.5	15.4	15.9	15.0	16.6	18.3	15.0
Missouri Valley:												
Leavenworth, Kans.	17.7	18.3	18.6	18.1	19.3	19.5	20.1	17.2	18.9	21.3	19.6	13.9
Omaha, Neb.	20.8	21.6	19.6	17.3	20.2	20.1	20.6	17.5	18.8	20.5	21.1	15.8
Bennett, Fort, Dak.	28.6	23.4	22.4	22.8	26.7	26.0	24.1	24.7	28.9	28.1	31.0	20.2
Huron, Dak.	26.5	25.0	21.0	20.2	24.6	24.1	22.3	24.2	25.9	24.6	25.8	18.0
Yankton, Dak.	22.6	20.7	18.4	17.0	21.2	21.9	19.6	19.7	23.3	22.3	22.8	15.3
Extreme Northwest:												
Moorhead, Minn.	25.1	22.9	22.5	18.6	24.4	24.4	22.3	22.6	20.2	20.9	18.8	15.6
Saint Vincent, Minn.	24.7	22.5	23.6	19.2	27.2	25.1	22.4	23.5	21.9	21.1	19.2	19.6
Bismarck, Dak.	22.1	18.7	19.4	17.4	23.1	26.4	22.0	22.8	20.2	23.2	22.6	15.1
Buford, Fort, Dak.	23.7	25.6	21.2	23.1	28.8	29.8	26.3	31.4	24.8	27.5	22.3	17.5
Totten, Fort, Dak.						25.5	24.1	24.8	23.2	23.6	20.7	16.7
Northern Slope:												
Asinaboina, Fort, Mont.	20.2	18.4	25.2	24.6	28.3	24.2	24.0	29.3	20.8	25.6	24.4	19.1
Benton, Fort, Mont.	20.4	21.4	18.8	25.6	33.5	29.5	38.2	34.4	26.0	27.3	28.7	21.2
Custer, Fort, Mont.	23.8	19.7	20.0	26.0	29.9	28.9	29.9	32.6	26.0	29.9	27.8	18.7
Helena, Mont.	14.7	15.0	15.0	17.6	21.6	20.1	20.5	22.7	16.5	19.0	16.2	14.0
Maginnis, Fort, Mont.	17.1	18.2	15.7	18.8	22.8	21.4	21.9	22.6	19.2	23.7	20.4	13.6
Poplar River, Mont.	22.7	19.6	(¹)	20.7	28.4	28.1	25.5	32.5	23.3	30.8	28.5	19.0
Shaw, Fort, Mont.	18.6	19.1	21.3	23.0	28.5	26.1	25.0	30.1	22.2	24.2	23.6	17.2
Deadwood, Dak.	19.5	20.1	16.1	14.2	18.8	18.9	19.8	19.1	18.4	30.6	18.9	17.7
Cheyenne, Wyo.	21.1	20.0	20.6	22.5	26.1	29.1	29.5	26.0	30.0	29.5	25.4	26.4
North Platte, Nebr.	23.8	22.1	19.6	18.6	20.7	21.7	21.6	20.7	23.6	25.0	26.5	18.0
Middle Slope:												
Denver, Colo.	23.5	21.4	20.6	21.1	22.5	24.3	23.3	23.8	26.8	26.7	26.4	23.9
Pike's Peak, Colo.	12.4	12.0	11.4	11.4	12.0	10.7	13.8	11.3	13.6	11.6	10.3	10.3
West Las Animas, Colo.	32.6	29.7	32.1	29.2	29.1	28.8	32.1	29.2	34.0	33.2	34.6	26.5
Dodge City, Kans.	26.0	22.8	25.7	25.5	24.1	21.5	22.1	19.9	23.6	22.2	24.1	17.0
Elliot, Fort, Tex.	24.8	25.3	27.4	27.6	24.6	22.5	25.9	21.8	25.5	21.3	25.2	19.5
Southern Slope:												
Concho, Fort, Tex.	23.4	26.4	29.8	28.7	25.7	27.0	29.3	27.2	23.3	22.5	22.3	24.7

¹ Record incomplete.
² 27 days.

³ Made a station of the second order June 9, 1894.
⁴ 28 days.

⁵ 29 days.
⁶ 26 days.

⁷ 23 days.
⁸ 25 days.

Mean daily range of temperature at stations of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Southern Slope—Cont'd.	°	°	°	°	°	°	°	°	°	°	°	°
Davis, Fort, Tex.	25.9	27.3	25.8	25.7	29.9	27.0	27.8	25.6	23.4	22.2	25.6	25.6
Stockton, Fort, Tex.	27.6	27.8	29.1	29.8	29.2	26.8	29.3	25.1	21.9	21.0	21.0	24.0
Southern Plateau:												
El Paso, Tex.	29.3	24.9	29.1	32.4	36.4	35.8	32.6	28.9	26.0	22.0	28.5	24.5
Apache, Fort, Ariz.	30.1	24.6	25.0	32.0	35.8	40.0	38.7	31.1	34.3	28.6	35.8	25.4
Grant, Fort, Tex.	19.7	16.2	18.3	20.7	20.9	22.8	22.3	22.6	22.1	18.3	22.0	20.2
Prescott, Ariz.	24.7	20.9	20.2	24.1	27.5	32.8	31.1	28.0	29.4	27.2	33.0	22.4
Thomas, Camp, Ariz.	26.9	24.0	25.8	31.2	35.0	38.3	33.0	28.6	32.3	25.8	31.5	24.8
Yuma, Ariz.	21.9	18.3	21.4	28.8	29.5	30.5	29.4	26.4	28.9	26.0	26.2	19.8
Middle Plateau:												
Salt Lake City, Utah.	15.2	16.5	15.5	17.4	19.5	22.6	25.6	23.3	21.0	18.2	18.7	13.0
Northern Plateau:												
Boise City, Idaho.	26.6	17.5	16.0	19.5	22.5	22.3	25.2	27.1	10.7	20.7	19.1	16.1
Lewiston, Idaho.	13.3	16.3	19.0	24.6	30.4	23.5	25.3	32.5	22.3	19.4	16.3	13.3
Dayton, Wash.	13.9	18.3	18.9	24.8	29.8	26.7	28.8	35.3	24.4	21.8	15.8	16.4
Spokane Falls, Wash.	15.1	17.4	18.6	23.2	28.5	24.8	25.6	31.1	20.4	19.2	13.8	15.0
North Pacific Coast:												
Canby, Fort, Wash.	8.4	11.5	10.2	11.0	11.0	9.5	10.9	11.9	9.5	10.3	8.3	9.7
Olympia, Wash.	9.5	14.6	18.1	20.1	26.2	22.5	22.6	23.4	10.0	15.1	9.7	11.5
Tatoosh Island, Wash.	5.2	6.7	9.1	8.9	9.8	9.1	9.5	9.4	7.7	7.9	7.2	7.6
Portland, Oreg.	13.0	15.0	17.8	19.8	24.9	21.2	19.1	24.2	17.1	17.1	13.7	12.0
Roseburg, Oreg.	11.3	17.1	18.2	17.6	25.3	20.6	22.2	(⁶)	(⁶)	20.0	16.7	14.5
Middle Pacific Coast:												
Cape Mendocino, Cal.	9.5	11.3	12.0	10.3	11.0	11.0	9.9	11.8	10.8	11.8	11.3	9.5
Red Bluff, Cal.	16.6	13.6	17.7	18.4	23.1	23.4	23.4	29.6	25.8	25.3	23.7	16.4
Sacramento, Cal.	18.0	17.2	14.0	16.4	19.8	18.7	25.2	27.9	26.0	22.6	22.9	14.6
San Francisco, Cal.	8.1	10.3	9.3	10.4	11.8	9.9	12.7	11.0	10.7	11.4	9.9	7.9
South Pacific Coast:												
Los Angeles, Cal.	21.5	16.5	16.1	19.3	18.4	21.1	23.3	27.0	25.7	28.1	25.2	17.2
San Diego, Cal.	19.0	14.4	12.5	13.3	11.4	13.7	14.6	14.1	12.9	14.6	18.1	13.7
Alaska Stations:												
Saint Michael's, Fort, Alaska.	15.5	15.4	13.1	12.3	12.2	13.6	9.3	11.3	9.5	11.0	12.7	14.9
Sitka, Alaska.	9.6	12.0	9.3	14.0	11.0	11.4	11.5	11.3	13.1	10.9	9.4	11.0
Unalakshka, Alaska.	9.2	6.9	11.0	13.0	11.9	12.6	12.8	9.8	11.2	10.7	8.4	8.9
Behring's Island, Behring Sea.	8.6	8.4	8.5	9.1	9.0	9.3	9.0	7.5	10.7	9.0	8.3	9.3

¹ 22 days. ² 29 days. ³ 26 days. ⁴ 23 days. ⁵ Record incomplete. ⁶ No record. ⁷ 27 days.

APPENDIX 14

Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations of the commencement of observations at each,

[From self-regie-

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
New England:										
Eastport, Me.....	51	1874	47	1874, 1878	53	1878	63	1877	80	1877
Portland, Me.....	58	1876	58	1880	65	1874	78	1881	94	1880
Mount Washington, N. H.....	42	1874	43	1883	47	1876	50	1883	62	1879, 1880
Boston, Mass.....	66.6	1876	64	1880	72	1880	85	1872	97	1880
Thatcher's Island, Mass.....	60	1880	60	1880	66	1880	76	1881	86	1880
Block Island, R. I.....	56	1883	54	1884	55.3	1884	62	1883	78.3	1881
Narragansett Pier, R. I.....	48	1884	52	1883	60	1884	66	1882	75	1883, 1884
Point Judith, R. I.....	50	1884	47	1884	58.2	1884	59	1883, 1884	70	1884
New Haven, Conn.....	68	1876	65	1880	69	1880	75	1880	89	1880
 New London, Conn.....	65	1880	62	1880	64	1878	74	1880	89	1881
Middle Atlantic States:										
Albany, N. Y.....	59	1876	58	1880	64	1878	80	1881	92	1880
New York City.....	64	1876, 1880	69	1874	72	1879	81	1872, 1877	94	1880
Philadelphia, Pa.....	67	1876	75	1874	75	1880	87	1872	96	1880
Atlantic City, N. J.....	64	1880	71	1880	72	1880	79	1878	89	1877, 1880, 1881
Barnegat City, N. J.....	61	1874, 1879, 1880	70	1880	73	1880	79	1880	91	1880
Cape May, N. J.....	58	1874, 1876	59	1880	65	1880	76	1879	81	1874, 1880
Little Egg Harbor, N. J.....	51.4	1884	61	1883	61	1883	74	1882	90.3	1884
Sandy Hook, N. J.....	63	1874	71	1874	67	1880	77	1880	93	1880
Delaware Breakwater, Del.....	56	1882	66	1880	73	1880	79	1880	89	1880
Baltimore, Md.....	71	1876	78	1874	76	1880	84	1881	95	1881
 Ocean City, Md.....	58	1883	71	1883	65	1883	74	1883	85.7	1884
Washington City.....	71	1874, 1876	78	1874	79	1880	90	1872	96	1880
Cape Henry, Va.....	78	1876	80	1880	83	1879	85	1876, 1878, 1880, 1881	93	1875
Chincoteague, Va.....	69	1882	71	1883	72.2	1882	79	1881	88	1881
Lynchburg, Va.....	72	1876, 1879	75	1874	79	1879	91.6	1873	94	1877
Norfolk, Va.....	80	1871	81	1871	81	1880	92	1871	98	1880
 South Atlantic States:										
Charlotte, N. C.....	70	1879, 1880	76.5	1883	79	1880	85	1880, 1881	94.4	1881
Hatteras, N. C.....	66	1884	71	1884	69.8	1884	75	1881	86	1881
Kitty Hawk, N. C.....	78	1876	77	1880	80	1878, 1880	84	1878, 1880	93	1880

APPENDIX 14.

Signal Service, United States Army, for each month and the year. (Compiled from the com- to and including December, 1884.)

tering thermometers.!

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
82	1884	96	1878, 1880	88	1880	82.8	1884	80	1879	64	1882	54	1877	88	1880
94	1878	97	1876	95	1876	94.5	1881	83	1879, 1881	66	1882	59	1884	97	1876
71	1878	72	1881	74	1872	65	1880	59	1871	47.2	1881	48	1884	74	1881
98	1874	101	1880	96.8	1881	101.5	1881	90	1881	75	1876	66	1881	101.5	1881
87.7	1884	89.9	1882	85	1876, 1879, 1880	95	1881	81	1879	66	1882	67.4	1881	95	1881
82.6	1884	86	1881, 1882	82	1882	84.5	1881	75.4	1881	70	1881	60	1884	86.5	1881
91	1884	89	1882	91	1882	89	1882	79	1884	72	1882	59	1884	91	1884
78	1883	84	1883	82	1883	80	1884	72	1884	70	1882	58	1884	84	1883
93	1880, 1884	95	1876	90	1878, 1876, 1881, 1884	100	1881	86	1881	71.5	1882	62	1875	100	1881
89	1880	98	1876, 1879	90	1878	92	1881	82.7	1879	72	1882	60.5	1879	98	1876, 1878
93	1874	94	1883	98	1876	96	1881	84	1881	70	1876	63	1881	96	1881
95	1875	99	1876	95	1881	100.2	1881	83.8	1881	74	1882	66.2	1881	100.2	1881
97	1874	100	1876	99	1881	101.5	1881	87	1879, 1881	77	1876	70	1878	101.5	1881
98	1874, 1880, 1881	99	1880	91.8	1881	94	1880	83	1881, 1884	72	1882	64	1877	99	1880
95.6	1882	96	1879	95	1874	96	1881	82.5	1881	73	1879	68	1875	96	1879, 1881
89	1873, 1880	91	1872	88	1873, 1877	87	1880	85.7	1884	69	1879, 1884	62	1881	91	1872
96	1882	99	1882	96	1882	95	1882	81.6	1884	75	1882	59.4	1884	99	1882
97	1874	100	1876	96.2	1881	101	1881	87	1881	73	1881	68.5	1881	101	1881
99	1880	91	1880	93	1881	98	1881	84	1881	73	1881	69	1881	93	1881
97.5	1874	99	1876, 1879, 1880	98	1881	101	1881	89	1879, 1881	78	1879	71	1881	101	1881
89	1883	88	1884	89	1882	85.6	1884	83.9	1884	68	1884	61	1884	89	1882, 1883
102.5	1874	102	1879	101	1881	104.3	1881	92.3	1881	80	1879	73	1873	104.3	1881
96	1874	101	1875, 1878	103	1881	94	1875, 1877, 1881	89	1879, 1881, 1883	81	1876, 1879, 1881	76	1875	103	1881
93	1880	94.5	1884	91	1881	87.8	1884	84.2	1884	79	1882	64	1881	94.5	1884
97	1874	101.8	1881	100	1881	98.8	1881	91.3	1884	80.2	1882	73	1873	101.8	1881
102	1874	102.5	1876	99	1881	96	1880	89	1881, 1884	80	1879	73	1873, 1874, 1875, 1879	102.5	1876
97	1881	101	1879	100.5	1881	94	1881	91.9	1884	80	1879	71	1884	101	1879
91	1882	92	1881	92	1881, 1883	90	1881	90	1881	79	1882	71	1884	92	1881, 1883
99	1880	100	1876	99	1881	95	1880	90	1881	79	1879	73	1875, 1879	100	1876

Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations of

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
South Atlantic States—Cont'd:										
Macon, Fort, N. C.	63	1883	70	1882	70.7	1884	74.3	1884	91	1881
New River Inlet, N. C.	60	1883	71	1884	75	1884	88.9	1884	86.1	1884
Scott's Hill, N. C.	60	1884	78	1883	80.8	1884	85.5	1884	84.5	1884
Smithville, N. C.	73	1876	73	1880	75	1884	85.6	1884	90	1881
Wilmington, N. C.	77	1879	81	1880	84	1878	90	1880	95	1878
Charleston, S. C.	80	1879	78	1876, 1880, 1882	85	1882	87	1880	94	1878
Augusta, Ga.	79	1879	82	1883	89.3	1882	90	1880	100	1878
Savannah, Ga.	80	1879	80	1876, 1880, 1883	87	1882	89	1878	96	1878
Jacksonville, Fla.	80	1875, 1876, 1877, 1879	83	1876, 1883	88	1882	91	1874, 1880	96.5	1878
Florida Peninsula:										
Cedar Keys, Fla.	77	1880	79	1883	82	1882	88	1880	91	1880, 1881
Key West, Fla.	90	1877	87	1874	89	1878, 1874	91	1881	93.2	1881
Sanford, Fla.	86	1883	86	1883	88.5	1884	91.5	1884	94.7	1884
Eastern Gulf States:										
Atlanta, Ga.	73	1879, 1882	74.5	1883	81	1882	86	1880	91	1879
Pensacola, Fla.	73.6	1882	78.3	1883	82.7	1884	87.2	1883	93	1881
Mobile, Ala.	78	1882	78	1883	85	1879	90	1881, 1883	96	1878
Montgomery, Ala.	78.5	1882	81.2	1883	86.8	1882	90	1880	96	1875
Vicksburg, Miss.	80	1879	83.1	1883	85	1878, 1880	90	1881	95	1874, 1877
New Orleans, La.	78	1879	80	1883	84	1879	86	1882	92	1877
Western Gulf States:										
Shreveport, La.	78	1876, 1880	80.5	1876	90	1882	93	1880, 1882	101	1875
Fort Smith, Ark.	68.6	1884	78.4	1883	82.8	1884	88.5	1883	93.3	1883
Little Rock, Ark.	78	1880	77	1882	83	1882	94	1880	91	1880
Galveston, Tex.	75	1876, 1880, 1882	75	1882, 1884	85	1879	85	1878	91	1875, 1877
Indianola, Tex.	80	1880	80	1875, 1880	90	1879	91	1877	95	1879
Palestine, Tex.	76.5	1884	78	1882	84	1882	87.5	1883	90	1883
Rio Grande Valley:										
Brownsville, Tex.	83	1876	85	1876	92.3	1884	97	1878, 1879	99	1877
Rio Grande City, Tex.	90	1879	92	1882, 1884	98.2	1884	109	1878	112	1879
Ohio Valley and Tennessee:										
Chattanooga, Tenn.	73	1879	74	1880	82.5	1882	88	1880	93	1879
Knoxville, Tenn.	74	1876	79	1871	83	1882	88	1872	94	1877
Memphis, Tenn.	73	1876, 1880	79	1883	85	1879	88	1882	96	1879
Nashville, Tenn.	74	1879	77.4	1882	81.7	1882	90	1872	93	1874, 1879
Louisville, Ky.	71	1876	77.5	1883	79	1879	88.5	1883	96	1881
Indianapolis, Ind.	69	1876	72	1883	77	1875	85.3	1883	89	1874, 1881

the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
88	1881	98.5	1883	91	1883	87	1881	87	1881	78	1882	69	1881	91	1881, 1883
90	1883	94	1883	94	1883	98	1883	98.1	1884	77.2	1883	72	1884	94	1883
93	1883	100	1883	96	1883	92	1882	90	1883	81.1	1883	73	1884	100	1883
97	1840	100	1879	97.5	1876	93	1876	86.5	1884	78	1877	71	1875	100	1879
100	1880	103	1879	99	1878	96	1872	92.5	1884	83	1877, 1879	78	1879	103	1879
100	1877, 1880	104	1879	97.5	1881	94	1876	98	1883	82	1879	76	1881	104	1879
101.8	1881	105	1878	105	1878	97	1875	93.5	1884	84	1879	77	1874, 1875, 1880	105	1878
100	1880	105	1879	100	1878	96	1876, 1877	92	1884	82	1875	80	1875	105	1879
100.5	1880	104	1879	100	1874	98	1875	92	1883	84	1875, 1877	81	1875	104	1879
94	1880	94	1880, 1881	96	1883	94	1881	89	1881, 1884	81	1881, 1882	78	1881	96	1883
95.5	1881	97	1880	95.4	1881	95	1872	92	1876	91	1876	88	1876	97	1880
98	1883	99.4	1883	96.9	1883	94.8	1884	94	1884	85.5	1884	84.6	1884	99.4	1883
94.8	1881	97.5	1881	96.2	1881	90.5	1881	90.8	1884	80.5	1882	71	1879	97.5	1881
97	1881	97.2	1884	94	1884	93.5	1884	95.2	1884	81.8	1882	76	1880	97.2	1884
100	1877, 1882	101	1883	100	1874	96	1881	93.4	1884	82	1882	78.8	1884	101	1883
105.5	1881	106.9	1881	103	1874	97	1875, 1877, 1884	96.1	1884	83	1879, 1882	77.1	1884	106.9	1881
101	1881	100	1878, 1881	100	1878	98	1881	98.7	1884	84.5	1882	79	1873, 1875	101	1881
97	1881	96	1877	96.5	1877	92.8	1884	90	1884	82	1879, 1882	78	1871, 1875, 1879, 1880	97	1881
104	1875	107	1875	105	1881	101	1881	95	1883	86	1882	79	1875	107	1875
101	1882	104.5	1884	103.7	1884	99.9	1884	94.6	1884	86	1882	78.1	1883	104.5	1884
98	1882	101.8	1884	102	1881	97	1881	90	1881, 1883, 1884	83	1882	74	1880, 1883	102	1881
97	1875	97	1875	98.5	1874	94	1875, 1876	87.2	1884	82	1875, 1876	75	1879, 1881, 1883	98.5	1874
98	1878	98	1872, 1876, 1879, 1884	100	1874, 1877	96	1877	93	1877	87.8	1882	79	1879	100	1874, 1877
96	1882	96.2	1884	97.9	1884	95.5	1883	94	1883	86	1882	76.2	1884	96.2	1884
102	1878	94	1877, 1883	101	1877, 1883	96	1877, 1878, 1879, 1883, 1884	95	1877	89	1882	83	1875, 1880	102	1878
100	1883	110	1884	112	1877	107	1877	105	1877	92.7	1883	88	1880	112	1877, 1879
95	1881	101	1879	100.5	1881	96	1881	90.8	1884	78	1882	72	1879	101	1879
96	1880	100	1879	100	1881	97.1	1881	94	1884	80.5	1881	75	1874	100	1879, 1881
100	1881	99	1875, 1879, 1881	102	1881	98	1881	92	1879, 1884	82	1879	74	1875	102	1881
99	1874	101.2	1881	104	1874	98.2	1881	91.9	1884	80.6	1882	75	1874	104	1874
100	1874	102	1874	104.6	1881	99	1881	90	1884	78	1879	74	1875	104.6	1881
96	1874	101	1881	101	1881	94.5	1881	87	1884	75	1879	68	1875	101	1881

Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations of

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Ohio Valley and Tennessee—Cont'd.										
Cincinnati, Ohio.....	60	1876	73	1883	77	1875	85	1873, 1878	94	1874, 1875
Columbus, Ohio.....	64	1880	73	1883	71	1879	86	1883	92	1881
Pittsburg, Pa.....	75	1874	76.5	1883	80	1876	88	1878	95	1881
Lower Lakes:										
Buffalo, N. Y.....	65.5	1874	63.8	1883	72	1875	82.6	1883	87	1876
Oswego, N. Y.....	64	1874	61	1880	67	1871	78	1872, 1884	94	1879
Rochester, N. Y.....	60	1874	63	1875	69	1875	83.5	1883	90	1879
Erie, Pa.....	73	1876	70	1883	78	1875	86	1883	91	1879
Cleveland, Ohio.....	70	1874	72	1883	76	1875	85	1872, 1883	92	1879
Sandusky, Ohio.....	64	1880	70	1883	70	1878, 1879	80	1878	92	1879
Toledo, Ohio.....	66	1873, 1876	65	1883	75	1875	85	1872	95	1871
Detroit, Mich.....	65	1876	64.3	1884	75	1875	78.5	1883	90.5	1881
Upper Lakes:										
Alpena, Mich.....	52	1876, 1880	58	1880	66	1879	76	1881	91	1874
Escanaba, Mich.....	45	1879	52	1877	57	1879	65	1875, 1880	83	1881
Grand Haven, Mich.....	57	1880	58	1880	71	1878	80	1883	86	1877
Mackinaw City, Mich.....	39.8	1884	43	1883	52.2	1884	66.1	1884	79.5	1883
Marquette, Mich.....	56	1880	60	1877	70	1878	81	1877	92	1879
Port Huron, Mich.....	64	1876	59	1880	73	1875	81.4	1883	88	1881
Chicago, Ill.....	65	1876	68	1876, 1880	73	1875	83	1873	89	1874
Milwaukee, Wis.....	50	1871	60	1882	70	1878	82	1871	90	1874
Duluth, Minn.....	51	1877	57	1877	62	1875, 1879	75	1881	91	1874
Upper Mississippi Valley:										
Saint Paul, Minn.....	49	1879	59	1880	68	1879	82	1879, 1882	94	1874
La Crosse, Wis.....	50	1874	65	1882	72	1875	83	1879	96	1874
Davenport, Iowa.....	60	1874	66.7	1882	74	1875	81	1879	90	1874
Des Moines, Iowa.....	63	1880	68	1880	80	1880	89	1883	93	1880
Dubuque, Iowa.....	62	1874	67.2	1882	75	1875	84	1879	94	1874
Keokuk, Iowa.....	64	1874	69	1882	80	1875	85	1883	92	1874
Cairo, Ill.....	70	1876, 1880	74	1883	84	1879	89	1873	92	1874
Springfield, Ill.....	64	1880	72	1882	78	1882, 1883	85	1883	88	1881
Saint Louis, Mo.....	72	1880	73.2	1882	82	1879	87.5	1883	93	1874
Missouri Valley:										
Leavenworth, Kans.....	65	1876	73	1876	84	1879	89	1880	94	1874, 1875
Omaha, Nebr.....	62	1879, 1880	66	1880	82	1879	89	1880	92	1880
Bennett, Fort, Dak.....	55	1882	63	1882	78	1882	86	1882	92	1881
Huron, Dak.....	45.5	1882	57.2	1882	74.8	1882	81.2	1882	83	1884
Sully, Fort, Dak.....	55	1876, 1882	67	1882	76	1883	93	1884	101	1874
Yankton, Dak.....	67	1880	68	1876	87	1879	89	1874	94	1880
Extreme Northwest:										
Moorhead, Minn.....	43	1884	49	1882	53	1884	74	1883	88	1881
Saint Vincent, Minn.....	36.3	1884	42	1882	49	1881	73	1881	85.1	1884
Bismarck, Dak.....	49	1880	60	1877, 1882	72	1878	80	1881	92	1880
Buford, Fort, Dak.....	47	1880	57	1882	70	1879, 1883	92	1881	95	1880

the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
98.5	1874	103.5	1881	101	1881	96	1881	87.7	1884	75	1879	72	1875	103.5	1881
93	1879	103	1881	98	1881	96	1881	87	1884	74	1879	63	1881	103	1881
98	1874	102.7	1881	98.8	1881	101.6	1881	91.1	1884	79	1876	69	1873, 1875, 1880	102.7	1881
92	1878	90	1878	90.8	1881	88.1	1884	83	1879	68.3	1881	62	1875	92	1878
98	1875	100	1878	97.5	1883	93.4	1881	84	1877	71	1876	65	1875	100	1878
94	1875	96	1881	96	1874, 1881	96	1881	87	1879	71	1876, 1879	70	1875	96	1881
91	1874, 1875	94	1878	93	1881	92	1881	85	1879	73	1882	68	1875	94	1878
96	1874	96	1878	96.7	1881	96	1881	87	1879	72.5	1882	68	1875	96.7	1881
92	1880	96	1879	96	1881	95.8	1881	87	1879	76	1879	68	1879	96	1881
89	1873	97	1872, 1874	97	1881	95	1881	86	1873	73	1876, 1882	66	1875	99	1872
98	1874	100	1878	98.8	1881	97	1874	85	1879, 1884	69	1879, 1882	63	1875	100	1878
97	1874	97	1876	92	1878	98	1884	84	1884	63	1874	56	1875	97	1874, 1876
88	1874, 1881	92	1874, 1878	89	1876, 1878	84	1880	77.6	1884	62.6	1884	48	1875	92	1874, 1878
88	1874	90	1878	92	1881	85	1878, 1881	80	1879	69	1874	61	1877	92	1881
81.4	1884	80.2	1883	89.4	1884	88.9	1884	79	1884	60	1882	51.5	1883	89.4	1884
95	1879	100	1878	96	1879	97	1874	87	1879	66	1874	59	1875	100	1878
90	1878, 1879	95	1878	96.5	1881	97	1881	86	1879	67.6	1882	65	1875	97	1881
98	1872	99	1874	98	1874	93.9	1881	84	1879	72	1874, 1882	68	1875	99	1874
94	1872, 1874	96	1871, 1874, 1878	98	1874	94	1872, 1874	83.1	1884	70	1874, 1882	68	1877	98	1874
82.2	1883	99	1883	98	1881	90	1874	78	1879	65	1874	51	1883	99	1883
94	1874	100	1883	98	1880	94	1878	87	1879	72	1874	56	1877	100	1883
98	1874	101	1874	96	1874, 1881	92	1873	84	1879, 1884	70	1874	60	1877	101	1874
98	1874	98	1874	96.3	1881	94	1881	85	1879	71	1874, 1879	63	1877	98	1874
95.5	1881	99.5	1881	103	1881	98	1881	85.8	1884	71	1882	57	1883	103	1881
98	1874	101	1874	97.3	1881	94.2	1881	86	1879	69	1874, 1879	64	1877	101	1874
96	1873	100	1874	102	1878	97	1881	87	1879	74	1874, 1882	68	1875	102	1873
96	1873	99	1874, 1881	103	1881	97	1881	88	1872, 1881, 1884	80.5	1882	72	1875	103	1881
94	1881	101.5	1879	99.5	1881	94.7	1881	88	1879	76	1879	64	1883	101.5	1879
99	1881	104	1881	106.4	1881	101.5	1881	90	1879	83	1879	74	1875	106.4	1881
96	1875	104	1874	107	1874	101	1882	89	1871, 1874	77	1874	72	1875	107	1874
98	1881	105	1874	105	1874	98.8	1881	87	1879	74	1874	66	1875	105	1874
94	1881	101	1881	104	1881, 1882	95	1882, 1883	90	1880	69.8	1884	62	1881	104	1881, 1882
94.1	1883	99.2	1883	95.6	1881	95.9	1884	81.8	1884	69.9	1884	58	1881	99.2	1883
111	1874, 1876	106	1874	107	1876, 1881	107	1874	88.8	1884	70	1883	65	1875	107	1874, 1876
97	1876	103	1883	103	1873	100	1881	89	1879	76	1876	62	1875	103	1873, 1883
100.3	1883	95.1	1881	93.5	1882	88	1882	77.7	1884	56.3	1884	55	1883	100.3	1883
93	1883	90	1883	90	1882	89	1883	77	1880	58.7	1884	44.8	1884	93	1883
89	1883	102	1881	105	1876	94	1882	88	1879	67	1876	60	1881	105	1876
107	1883	104	1881	107	1882	100	1882	95	1879	62	1879	56.8	1884	107	1882, 1883

Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Northern Slope:										
Assinaboine, Fort, Mont.....	46	1882	56	1882	67	1882	81	1881	86.1	1884
Benton, Fort, Mont.....	58	1880	62	1882	74	1882	81	1880	93	1875
Custer, Fort, Mont.....	60	1880	65	1881	76	1882	85	1881	84	1880, 1881, 1882, 1883, 1884
Helena, Mont.....	51.2	1884	60	1881	66	1881	78	1881	77	1880, 1881, 1882
Maginnis, Fort, Mont.....	48.1	1884	57	1883	58	1883	65.6	1884	78.4	1884
Shaw, Fort, Mont.....	51	1884	58	1883	71	1882	80	1880	84	1881
Deadwood, Dak.....	62	1883	62	1883	78	1882	82	1881	84	1880
Cheyenne, Wyo.....	68	1880	59	1879, 1880, 1881	77	1879	80	1874	88	1874
North Platte, Nebr.....	70	1880	68.3	1882	86	1879	92	1880	94	1880
Middle Slope:										
Denver, Colo.....	67	1882	72	1879	81	1879	88	1874	92	1874
Pike's Peak, Colo.....	80	1879	29	1876	43	1879	39	1876	47	1880
West Las Animas, Colo.....	68.2	1884	71.2	1884	79.3	1884	82.5	1882, 1883	91	1883
Dodge City, Kans.....	70	1876	78	1876	89	1879	92	1880	98	1879, 1880
Reno, Fort, Ind. T.....	72	1884	73	1884	82	1883	91	1883	90	1884
Elliott, Fort, Tex.....	81	1880	78	1880	86	1880	96	1880	94	1880
Southern Slope:										
Sill, Fort, Ind. T.....	75	1880	79	1879, 1880	95	1879	96	1880	97	1880
Concho, Fort, Tex.....	78	1879	87	1880	97	1879	98	1880	107	1879
Davis, Fort, Tex.....	77	1880	79	1879	87	1879	95	1879	101	1881
Stockton, Fort, Tex.....	82	1880	83	1879	92	1879	101	1879	104	1879
Southern Plateau:										
Santa Fe, N. Mex.....	76	1879	73	1879	82	1879	84	1879	89	1873
El Paso, Tex.....	74	1880, 1881	82	1879	88	1879, 1882	98	1879	102.8	1884
Apache, Fort, Ariz.....	67	1881, 1882	74	1881	83	1879	89	1879	93	1881
Grant, Fort, Ariz.....	77	1879	80	1879	87	1879	93	1879	94	1879
Phoenix, Ariz.....	86.7	1883	87.5	1884	94	1879	104.9	1882	107.2	1883
Prescott, Ariz.....	71	1882	80	1879	90	1879	86	1879	90	1878
San Carlos Agency, Ariz.....	72	1883	79	1884	87	1882	95	1882	102	1883
Thomas, Camp, Ariz.....	70	1881	75	1881	85	1881	92	1881	97	1881
Verde, Fort, Ariz.....	73	1879	81	1879	90	1881	96	1879	98.5	1884
Wickenburg, Ariz.....	76	1879	82	1879	92	1879	98	1879	97	1884
Yuma, Ariz.....	80	1879	90	1879	100	1879	105	1876	108.7	1883
Middle Plateau:										
Winnemucca, Nev.....	57	1878	69	1879	82	1879	79	1881	86	1881, 1882, 1883
Salt Lake City, Utah.....	54	1879	68	1879	77	1879	83	1874	91	1874
Northern Plateau:										
Boise City, Idaho.....	61.5	1884	64	1879	76	1881	80	1879	88	1881
Cœur d'Alene, Fort, Idaho.....	50	1884	60	1884	80	1884	78	1884	85	1884
Lewiston, Idaho.....	59	1880	63	1881	78.5	1882	86	1880	92	1884
Dayton, Wash.....	61	1880	64	1881	83	1881	91	1880	90	1880
Spokane Falls, Wash.....	50.9	1884	52	1881	74	1881	73	1884	84.8	1884
North Pacific Coast:										
Canby, Fort, Wash.....	55	1884	68	1884	64.2	1884	78.2	1884	76	1884
Olympia, Wash.....	54	1884	59.1	1884	71	1881	82	1880	87	1878, 1884
Portland, Oreg.....	50.2	1881	64.7	1884	76.5	1881	85	1880	90	1884
Roseburg, Oreg.....	65	1878	68.7	1883	80	1881, 1883	84.5	1880	88.2	1884

of the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
101	1883	95	1882	98	1882	96	1882	83	1884	68.1	1884	63.8	1884	101	1888
101	1881	107	1881	108	1881	95	1881	87	1875	71.6	1884	62.2	1884	108	1881
107	1883	103	1881	103	1882	95	1883	87	1879	69	1879	61	1881	107	1883
95	1880	96	1880	95	1880	86	1880	75	1880	62	1884	52	1883, 1884	96	1880
92	1883	92	1882	100	1882	88	1882	76.2	1884	60.8	1884	68.4	1884	100	1882
96	1880	96	1881, 1882	99	1881	91	1880	80	1880	67	1884	62.2	1884	99	1881
96	1880, 1881	102	1881	101	1881	91	1881	77	1880	68	1878	58.7	1883	102	1881
97	1880, 1881	100.5	1881	96.1	1882	88	1875	80	1873, 1874, 1879	69	1872, 1876	64	1877	100.5	1881
101	1876	107	1877	103	1878	101	1881	89	1879	79	1876	67	1878	107	1877
99	1873	102.8	1874	105	1878	93	1878	86	1873	76	1876, 1879	71	1874	105	1878
63	1881	64	1879	62	1878	56	1875	47	1879	33	1878, 1879	30	1877	64	1879
100	1882	104	1883, 1884	101	1882, 1884	97.5	1883	90.5	1884	77	1883	69.7	1884	104	1883, 1884
102	1880	106	1876	101.6	1881	99.8	1881	90	1883	88	1875	73	1875	108	1876
96	1884	105	1884	99.6	1884	98	1883	91	1884	83	1883	74	1883	105	1884
100	1880, 1881	102	1881	101	1881	98	1881	88	1880	81	1882	83	1880	102	1881
106	1881	107	1884	105	1881	100	1881	91	1873, 1884	88	1879	77	1880	107	1884
110	1882	108	1879	103.4	1883	100	1879	97	1877	85	1882	80	1879, 1880	110	1882
111	1881	110	1881	100	1884	94	1883	90	1881	81.6	1883	80	1881	111	1881
106.6	1881	107.4	1884	105	1877	100	1879	96	1878	87.6	1883	81	1879, 1881	107.4	1884
92	1881	95.5	1878	97	1878	90	1879	85	1878	77	1878	65	1878	95.5	1878
113	1883	111	1884	110.2	1884	104	1879	94	1879	82	1882	74.8	1881	113	1883
101	1883	102.5	1881	98	1879	96	1883	85.3	1884	77	1882	70	1881, 1882	102.5	1881
101.5	1883	100.9	1884	103	1879	98	1879	91	1878	79	1878, 1879	74	1878	108	1879
119	1883	114.6	1884	116	1883	114	1883	100.3	1884	97.8	1884	94.6	1882	119	1883
102	1878	103	1878	99	1878	100	1879	86	1881	75	1878	70	1881	103	1878
113	1883	114	1884	110	1884	108	1883	98	1881	82	1882	73	1881	114	1884
109	1883	112.5	1884	108.5	1884	100	1883	89.5	1883, 1884	81.5	1882	72	1881	112.5	1884
109.5	1881	114	1881	106	1878	104	1877	95	1881	80	1878	71	1878	114	1881
111	1884	112	1884	111	1877	108	1877	95	1877	88	1884	82	1884	112	1884
117	1883	118	1878	115	1879	113	1879	102	1876, 1879	91	1879	80	1878	118	1878
96	1881	104	1877	102.5	1882	94	1873, 1880	84	1879	67	1879	65	1878	104	1877
100	1883	98	1877	101	1875	93	1875	83	1876	70	1882	61	1874	101	1875
96	1882	106	1877	105	1883	96	1878	85	1879, 1880	70	1878	59	1879	106	1877
94	1883	95	1883	100	1882	89	1882	71	1883	59	1883	50	1883	100	1882
98	1883	104.8	1882	106.6	1882	93.5	1883	84	1880	63.2	1883	63	1879	106.6	1882
97.5	1884	102	1880	101.8	1884	91.3	1881	92	1880	66	1883	59.8	1881	102	1880
96.4	1883	97.5	1882	101.5	1882	87	1882	70.5	1884	58	1881	50	1881	101.5	1882
95	1884	78.2	1884	90.3	1884	86.4	1883	67	1884	64	1884	57	1883	90.3	1884
98	1878	93.5	1880	92	1884	81	1877, 1879	73	1880	63	1884	59	1880	95	1878
99	1876	95.5	1875	94.2	1884	90	1876	79	1876	68	1873	63	1875, 1880	99	1876
96.5	1878	97	1880	97.2	1884	90	1877, 1879	76	1877, 1880	69.7	1884	65	1880	97.2	1884

Highest temperature (in degrees Fahrenheit), and year in which it occurred, at stations

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Middle Pacific Coast:										
Cape Mendocino, Cal.	61.5	1884	68.5	1884	69	1883	63.1	1884	74	1882
Red Bluff, Cal.	71.5	1880	80	1883	85	1881	90	1878	101.4	1882
Sacramento, Cal.	64	1881	73.5	1879	80	1882	84	1881	96	1883
San Francisco, Cal.	69	1877	71	1884	77	1879	81	1875	86	1882
South Pacific Coast:										
Los Angeles, Cal.	82	1883	86	1881	90	1879	94	1881	100	1883
San Diego, Cal.	78	1877	82.6	1883	90	1879	87	1876	94	1879
Alaska Stations:										
Alexander, Fort, Alaska.	40	1882, 1883	37	1883	41	1883	48	1882	61	1882
Atka, Alaska.	45	1884	46	1884	45	1883	52	1882, 1884	52	1882, 1884
Hoonah, Alaska.	47	1884	47	1884	51	1883	63	1883	76	1883
Pyramid Harbor, Alaska.	48	1884	48	1883	50	1883	68	1883	70	1882
Saint Michael's, Fort, Alaska ...	43.6	1883	41	1883	43.5	1884	44	1882	57	1877
Sitka, Alaska.	50.8	1882, 1883	52.5	1884	55.8	1883	65.7	1883	69.2	1882
Unalaska, Alaska.	52	1882	51	1882	50	1882, 1884	59	1884	66	1883
Behring's Island, Behring Sea.	36.6	1884	38	1883	38.9	1884	39.5	1883	56	1883

of the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Highest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
83	1883	69	1883	69	1883	90	1883	75.8	1884	73	1872	71	1883	90	1883
105	1878	110	1879	110.5	1878	106	1877	94	1877	80	1879	74	1883	110.5	1878
102.5	1883	103.5	1883	103	1879	101	1883	85	1877	76	1880	68	1882	103.5	1883
95.2	1883	83	1881, 1884	89	1879	92	1877	84	1871	78	1871	68	1878	95.2	1883
103.5	1879	99	1884	101.5	1884	103.5	1883	96.5	1879	88	1884	83.2	1878	103.5	1879, 1883
94	1877	96	1877	91.5	1884	101	1883	92	1879	85	1878	82	1874	101	1883
78	1882	69	1882, 1884	78	1884	66	1882	65	1881	47	1881	43	1884	78	1882, 1884
72	1883	72	1883	68	1882, 1883	62	1882	54	1881, 1884	57	1883	45	1881	72	1883
76	1883	79	1883	75	1884	65	1884	56	1881, 1882, 1883	53	1884	54	1884	79	1883
78	1884	78	1884	74	1882, 1886	69	1883	65	1881	49	1884	49	1884	78	1884
75	1876	75	1877	69	1884	66.5	1883	60	1881	42	1874	45	1878	77	1876, 1877
74.6	1884	67.5	1883, 1884	79	1881	69.4	1883	60.8	1882	55.8	1884	56.8	1884	79	1881
68	1884	78	1882	78	1881	68	1881	62	1881	56	1881	50	1881	78	1881, 1882
60.7	1882	62.7	1884	63.6	1882	58.5	1882	49.9	1884	42.9	1883	40.7	1883	63.6	1882

APPENDIX 15.

Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of the movement of observations at each,

[From self-register

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
New England:										
Eastport, Me.	-30	1874	-30	1876	-4	1883	2	1874	29	1883
Portland, Me.	-11.5	1882	-7	1874, 1876	-7	1872	14	1874	34	1873, 1876
Mount Washington, N. H.	-46	1875	-4.2	1876	-49	1872	-18	1874	-1	1880
Boston, Mass.	-13	1882	-6.5	1876	-7.5	1872	11	1874	31	1882
Thatcher's Island, Mass.	-8	1882	-4	1880, 1881	4.5	1884	18	1881	31	1880
Block Island, R. I.	-4	1882	2	1881	10	1883, 1884	25	1881	36	1882
Narragansett Pier, R. I.	1	1883	4	1884	4	1884	23	1882, 1883	33	1884
Point Judith, R. I.	1	1883	5	1884	5.7	1884	21.2	1884	32.8	1884
New Haven, Conn.	-14	1873	-4	1881	0.8	1884	16	1874	30.5	1882
New London, Conn.	-10	1882	-6	1871	4	1884	19	1874	32	1876, 1882
Middle Atlantic States:										
Albany, N. Y.	-18	1878	-18	1875	-4	1875	13	1874	29	1874, 1876
New York City.	-6	1875	-4	1873	3	1872	20	1874	34	1876, 1880
Philadelphia, Pa.	-5	1875	-1	1875, 1881	5	1872	17.5	1874	36	1880
Atlantic City, N. J.	-3	1875	-5	1875	8	1884	19	1875	33	1876, 1880
Barnegat City, N. J.	-10	1875	-4	1881	10	1875	19	1875	34	1876, 1880
Cape May, N. J.	1	1879	3	1875	9	1872	24	1875	34	1882
Little Egg Harbor, N. J.	8	1883	12	1883	10.8	1884	23.4	1882	34.5	1882
Sandy Hook, N. J.	-3	1879	Zero.	1881	6.9	1884	12	1874	33	1874
Delaware Breakwater, Del.	9	1884	7	1881	15.3	1884	25	1881	40	1880
Baltimore, Md.	-6	1881	2	1873	5	1873	23.5	1875	34	1876
Ocean City, Md.	4	1884	14.8	1884	13.8	1884	27.2	1884	40	1883
Washington City.	-14	1881	-1.5	1875	4	1873	22.5	1875	33.5	1876
Cape Henry, Va.	9	1879	11	1875	12	1883	28	1875	41	1876
Chincoteague, Va.	3	1882, 1884	5	1881	15	1884	26	1881	40	1880
Lynchburg, Va.	-4	1877	3	1875	16	1884	25	1881	37	1876
Norfolk, Va.	3	1879	9	1875	16	1872	27	1875, 1880	38	1876
South Atlantic States:										
Charlotte, N. C.	5	1884	17.8	1884	23	1884	28	1881	40.5	1883
Hatteras, N. C.	15	1884	20	1881	26	1884	31	1881	47	1882
Kitty Hawk, N. C.	8.6	1884	11	1881	30	1876	29	1881	42	1876, 1877
Macon, Fort, N. C.	8.5	1884	20	1881	25.6	1884	30	1881	48	1882
New River Inlet, N. C.	4	1884	23	1884	23.1	1884	37	1883	46	1883
Scott's Hill, N. C.	4.9	1884	24.5	1884	20	1884	33	1884	45	1883
Smithville, N. C.	6	1884	18	1881	21	1876	29	1881	41	1876
Wilmington, N. C.	9	1884	15	1875	20	1873	28	1875	38	1876

APPENDIX 15.

*Signal Service, United States Army, for each month and the year. (Compiled from the com-
to and including December, 1884.)*

ing thermometers.]

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
30	1875	45	1882, 1884	45	1880	35	1875	24	1881	-13	1875	-21	1884	-21	1884
42	1875	51	1876, 1882	48	1874	37	1875	28	1876, 1879	-6	1875	-17	1872	-17	1872
15	1878, 1879	27	1883	20	1876	11	1879	-3	1881	-40	1875	-47	1876	-49	1872
42	1884	46	1874	47	1880	34	1879	25	1879	-2	1876	-12	1883	-13	1882
40.1	1881	50	1879	45.5	1883	39.5	1883	28	1879	9	1880	-7.2	1884	-8	1882
44.2	1884	55	1883	54.5	1884	41.5	1883	32.6	1884	19	1880	-3.2	1884	-4	1882
41	1884	42	1884	45	1883	39	1883	28	1884	15	1882	-9	1883, 1884	-9	1883, 1884
42	1884	52	1883	49	1883, 1884	41	1883	29	1884	15	1882	-8	1883, 1884	-8	1883, 1884
41.4	1884	51	1879	45.7	1884	35	1879	24	1879	2	1875	-9.5	1884	-14	1873
43	1876, 1884	51	1879	47.5	1884	37	1879	27.2	1883	4	1875	-7.5	1883	-10	1882
49	1875, 1878	48	1876	45	1875	33	1875, 1879	23	1876	-10	1875	-17	1875	-18	1875, 1878
47	1878, 1879	57	1873, 1882	53	1874	36	1872	31	1876	7	1875	-6	1880	-6	1875, 1880
47.2	1884	56	1883	53	1872	43	1879	31	1873, 1876	8	1875	-5	1880	-5	1875, 1880
46	1878	58	1880	58	1879	43	1875	29	1879	10	1875	-7	1880	-7	1880
47	1878	53	1879	53	1879	41	1875	28	1876	11	1875	-7	1880	-10	1875
47	1876	56	1880	55	1882	42	1871, 1875	31	1878	14	1875	2	1880	1	1879
46	1884	51.2	1882	55	1883	47.2	1883	30.1	1884	21.8	1884	-2	1884	-2	1884
49	1874	50	1880	55	1874	46	1875	33	1876	8	1875	-5	1880	-5	1880
50	1881	59	1882	60	1881	51	1882	34.5	1884	23	1880	1	1880	1	1880
49	1873	59	1876, 1882	52	1874	40	1873, 1879	30	1873, 1876, 1879	15	1880	-3	1880	-6	1881
55	1883	54.1	1884	57	1883	45	1882	32.2	1884	22	1883	8	1884	4	1884
46.5	1873	56.1	1884	50	1874	38	1879	26	1873	12.5	1880	-13	1880	-14	1881
51.4	1884	60	1881	60	1874, 1879, 1881	53	1880	39	1875, 1880	24	1880	7	1880	7	1880
50.1	1884	59	1882	60	1880, 1881	46	1882	36.5	1884	18	1880	1	1880	1	1880
49	1880	55	1876, 1882	50	1874	40	1875, 1879	28	1879	13	1880	-5	1880	-5	1880
53	1876, 1884	60	1876, 1877	58	1874	50.5	1875	31	1876	20	1872	6	1880	6	1880
51.5	1884	60	1882	56	1879	43	1879	30	1879	18	1880	-5	1880	-5	1880
50.5	1884	63	1881	64	1881	60	1882	47	1884	32	1881	8	1880	8	1880
52	1884	61.5	1884	62	1879, 1881, 1882	53	1876	38	1876	23	1879	8	1880	8	1880
55.1	1884	65	1881, 1882	63	1881, 1883	58	1882	43.8	1884	28	1881	15.2	1884	8.5	1884
46.2	1884	63.4	1884	60.9	1884	58	1883	36.4	1884	24	1883	12	1884	4	1884
47	1884	60.1	1884	60	1883	50	1882	30.5	1884	24	1883	11	1884	4.9	1884
50.6	1884	61	1881	58	1883	49	1879, 1881	35	1876	23	1879, 1881	10	1880	6	1884
51	1884	62	1881	56	1874	47	1879	32	1876	20	1872	10	1880	9	1884

Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
South Atlantic States—Continued:										
Charleston, S. C.....	13	1884	26	1881	28	1876	32	1881	47	1876
Augusta, Ga.....	14	1884	22	1875	22	1873	31	1881	42	1877
Savannah, Ga.....	18	1873	26	1884	27	1873	33	1881	48	1877
Jacksonville, Fla.....	21	1884	32	1875, 1878	31	1873, 1876	37	1881	48	1877
Florida Peninsula:										
Cedar Keys, Fla.....	25.2	1884	35	1881	40	1881	38	1881	50	1883
Key West, Fla.....	48	1879	55	1872, 1877, 1878	53	1873	61	1875, 1881	63	1877
Sanford, Fla.....	28.5	1884	40.4	1884	43	1884	49	1884	51	1883
Eastern Gulf States:										
Atlanta, Ga.....	-1.3	1884	11	1884	24.5	1884	25	1881	33.5	1883
Pensacola, Fla.....	16.3	1884	29	1884	36	1881	34	1881	46.6	1883
Mobile, Ala.....	13.9	1884	28	1875, 1876	31	1873, 1876	32	1881	47.3	1883
Montgomery, Ala.....	8	1884	23	1875, 1884	26	1873	30	1881	44	1883
Vicksburg, Miss.....	10	1875	21	1875	27	1876	31	1881	46	1877
New Orleans, La.....	20	1879	22.5	1875	23.5	1876	38	1881 ●	56	1871, 1877
Western Gulf States:										
Shreveport, La.....	6	1879	13.1	1884	26	1876	32	1881	47	1876, 1877
Fort Smith, Ark.....	-5	1884	8	1883	22.5	1884	35.3	1884	45	1883
Little Rock, Ark.....	5.5	1884	17	1884	26	1884	29	1881	44	1883
Galveston, Tex.....	20	1883	23.5	1884	34	1875	44	1873	54	1876
Indianola, Tex.....	15	1873	21.5	1883	32	1880	32	1875	51	1873
Palestine, Tex.....	6.5	1884	12.5	1883	31.8	1884	33.4	1884	50	1883
Rio Grande Valley:										
Brownsville, Tex.....	18	1881	27	1883	35	1880	43	1881	49	1877
Rio Grande City, Tex.....	19	1881	32	1880	32	1884	43	1881	49	1877
Ohio Valley and Tennessee:										
Chattanooga, Tenn.....	-1	1884	11	1884	22.3	1884	25	1881	41	1879
Knoxville, Tenn.....	-16	1884	6	1873	6	1873	24	1875, 1881	37	1880
Memphis, Tenn.....	-2	1884	12	1875	18	1876	27	1881	41	1883
Nashville, Tenn.....	-10.2	1884	9	1875, 1876	11	1873	25.5	1875	37	1877
Louisville, Ky.....	-19.5	1884	Zero.	1875	3	1873	21	1875	36	1873, 1876
Indianapolis, Ind.....	-25	1884	-8	1875	5	1884	19	1875	31	1877
Cincinnati, Ohio.....	-10	1879	-1	1875	1	1873	18	1875	35	1883
Columbus, Ohio.....	-20.3	1884	-2	1881	6	1884	15	1881	34	1883
Pittsburg, Pa.....	-12	1875	-10	1875	2	1877	14	1875	27	1876
Lower Lakes:										
Buffalo, N. Y.....	-13.5	1884	-13	1875	-2	1884	11	1881	29	1876
Oswego, N. Y.....	-13	1882	-10	1875	-11	1872	13	1874	31	1876
Rochester, N. Y.....	-12	1873	-12	1875	-7	1872	11	1879	28	1880
Erie, Pa.....	-15	1875	-16	1875	-1	1884	11	1881	32	1873, 1877, 1882, 1883
Cleveland, Ohio.....	-17	1873	-11.2	1875	-2	1873	15	1875	23.2	1876

the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
58.2	1884	67	1876, 1881, 1882	62	1879	54	1879	39	1873	28	1873, 1881	13	1880	13	1880, 1884
57	1882	62	1876	61	1874	48	1876	29	1873	24	1873	7	1880	7	1880
58.5	1884	66	1876	63	1879	54	1871	37	1873	22	1873	15	1880	15	1880
61.7	1884	68	1877, 1879	66	1874, 1875	56	1874	40	1873	30	1873	19	1880	19	1880
62	1884	69	1881	69	1881	64	1880	49	1880	33	1881	22	1880	22	1880
71.2	1882	72.7	1883	72	1882, 1884	71.5	1883	65	1873, 1876	52	1873	44	1876	44	1876
62.6	1884	69.8	1884	69	1883	64	1884	55.5	1884	44.4	1884	36	1883	28.5	1884
54	1879	57.8	1882	57	1879	44	1879	33.6	1884	20	1881	1	1880	-1.3	1884
64	1881	64.2	1882	66.4	1884	57.3	1882	45	1880	28.1	1881	17	1880	16.3	1884
61	1879	63.8	1882	63	1884	53	1871	34	1873	27	1872, 1877, 1881	14	1880	13.0	1884
58	1877, 1879	60.8	1882	61.5	1879	51.5	1876	33	1873	21	1872	8	1880	8	1880, 1884
53	1879	62	1881	62	1879	48	1871	34	1873	23	1877, 1880	12	1880	10	1875
65	1879	69.8	1882	65.5	1884	58	1871	40	1873	31.5	1881	20	1870, 1880	20	1870, 1879, 1880
55	1877	64	1877, 1880, 1882	58	1880	47	1881	31	1873	18	1880	10	1880	6	1879
59	1882	61	1882	58.4	1884	39.6	1883	39	1884	22	1882	9.5	1882	-5	1884
55	1882	61	1882	59.2	1884	47	1881	39	1880	10	1880	6	1880	5.5	1884
64	1877, 1879	69	1880	70	1877, 1880, 1882	59	1876	45	1873	29	1880	18	1880	18	1880
60	1877	68	1877	67	1880	60	1878	46	1873, 1880	22	1880	14	1880	14	1880
55	1882	63	1882	62	1884	49	1883	41	1883	20.5	1882	15.2	1884	6.5	1884
63	1877	68	1877	68	1884	57	1883	49	1879	30	1880	18	1880	18	1880, 1881
62	1877	63	1877	65.7	1884	53	1883	43	1878, 1879	30	1880	24	1880	19	1881
51	1879	57.5	1882	57	1879	47	1879, 1880	34	1884	17	1882	3	1880	-1	1884
47	1878	58	1882	50	1879	40	1871	25	1876	11.5	1872	-5	1880	-16	1884
54	1879	60	1882	59	1880	44	1875	29	1878	16	1877, 1880	3	1876, 1880	-2	1884
49	1877	56.2	1882	54.7	1883	41	1875	28	1873	13	1872	-3	1876	-10.2	1884
49	1875	57	1882	56	1880	42	1875, 1876	27	1878	4.5	1872	-7	1880	-12.5	1884
45	1877, 1882	53	1882	48	1876	35	1875	23	1878	-5	1880	-15	1876	-25	1884
49	1877	58.2	1882	55	1872, 1875	41	1875	27	1873	5	1880	-8	1872	-10	1879
43	1879, 1882, 1883	54	1882, 1883	50	1883	37	1879	25	1879	-5	1880	-12	1880	-28.3	1884
39	1879	52	1874	49	1876	35	1879	28	1873, 1876, 1878	4	1880	-9	1880	-12	1875
49.5	1879	47.5	1876	44	1880	35	1873	24.7	1884	2.5	1875	-9	1880	-12.5	1884
40.5	1875	49	1875	44.4	1884	36	1879	25.6	1884	-1	1875	-17.5	1884	-17.5	1884
36	1879	48	1873, 1884	42.8	1884	34	1878, 1879	19	1879	1	1875	-11	1871	-12	1873, 1875
42	1879	52	1883	50	1883	40	1879	28	1876	6	1880	-11	1880	-16	1875
49	1879	49.6	1883	45.6	1876	38	1875	26	1876	Zero.	1880	-12	1872, 1880	-17	1873

Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Lower Lakes—Continued:										
Sandusky, Ohio	-16.5	1879	-2.8	1884	6	1884	14	1881	24	1880
Toledo, Ohio	-14	1873, 1884	-12	1875	-3	1873	12	1875	30	1876
Detroit, Mich	-15	1875, 1879	-20	1875	-7	1872	8	1875	29	1875
Upper Lakes:										
Alpena, Mich	-27	1882	-27	1881	-19	1884	-2	1881	22	1882
Escanaba, Mich	-26	1881	-32	1875	-26.8	1884	2	1883	20	1882
Grand Haven, Mich	-12	1873	-24	1875	Zero.	1873, 1875	9	1874	28	1875
Mackinaw City, Mich	-15.9	1884	-10.6	1884	-20.2	1884	8	1883	28	1882
Marquette, Mich	-26	1881	-27	1875	-16	1884	2	1875	22	1875
Port Huron, Mich	-14.7	1883	-30	1875	-8	1875	7	1875	26.2	1882
Chicago, Ill	-20	1875	-13	1875	-12	1873	17	1875, 1879, 1881	27	1875
Milwaukee, Wis	-25	1875	-22	1875	-8.5	1884	12	1875	25	1875
Duluth, Minn	-38	1875	-34	1875	-26	1875	3	1874, 1881	26	1876
Upper Mississippi Valley:										
Saint Paul, Minn	-31.5	1884	-32	1875	-22.5	1873	7	1874	24	1875
La Crosse, Wis	-43	1873	-34	1875	-23	1873	10	1881	29	1875
Davenport, Iowa	-27	1884	-16	1875	-8	1884	16	1881	29	1875
Des Moines, Iowa	-30.4	1884	-23	1883	-5.6	1884	11	1881	33	1882
Dubuque, Iowa	-26.2	1881	-31	1875	-10	1875	14	1875	27	1875
Keokuk, Iowa	-24.2	1884	-11	1873	-2	1873	20	1875, 1879, 1881	29	1875
Cairo, Ill	-16	1884	4	1875	10	1873	24	1875	37	1875
Springfield, Ill	-22.3	1884	-2.4	1883	7	1884	19	1881	33.9	1882
Saint Louis, Mo	-21.5	1884	-3	1875	8	1873, 1876	22	1875	32	1875
Missouri Valley:										
Leavenworth, Kans	-29	1873	-12	1883	2	1876	13	1881	31	1875
Omaha, Nebr	-32	1884	-24.9	1883	-7	1880	6	1881	28	1875
Bennett, Fort, Dak	-42	1883	-34	1881	-11	1881, 1884	4	1881	30	1883
Huron, Dak	-38	1884	-31.8	1883	-14.6	1884	19.2	1882	23	1882
Sully, Fort, Dak	-39	1883	-30	1875, 1883	-22	1876	11	1875	15	1882
Yankton, Dak	-32	1881	-23.1	1884	-16	1876, 1880	-3	1881	24	1875
Extreme Northwest:										
Moorhead, Minn	-43	1884	-33	1881, 1883	-23	1884	-13	1881	26	1882
Saint Vincent, Minn	-44	1881, 1883	-38	1883	-31	1883	-14	1881	21	1882
Bismarck, Dak	-40	1884	-31	1875	-25	1875	1	1881	21	1875
Buford, Fort, Dak	-46	1883	-40	1883, 1884	-23	1880	7	1880	23	1882, 1883
Northern Slope:										
Assinaboine, Fort, Mont	-43	1883	-47	1883	-25.8	1884	7	1881	20	1881
Benton, Fort, Mont	-35	1875	-41	1883	-42	1876	-6	1875	26	1882
Custer, Fort, Mont	-31	1881	-38	1883	-23	1880	12	1883	23	1882
Helena, Mont	-34	1883	-32	1883	-9	1884	6	1881	25	1883
Maginnia, Fort	-29	1883	-35	1883	-14.1	1884	14	1883	19	1882

the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
47	1879, 1882	56	1880	48.5	1882	42	1879	30	1878, 1880, 1884	Zero.	1880	-13	1880	-16.5	1879
43	1873, 1875, 1878, 1879	50	1883	47	1879	36	1871	25	1876	5	1880	-15	1872	-15	1872
38	1875	50	1873, 1883	45	1875	29.8	1883	22	1873	Zero.	1880	-24	1872	-24	1872
33.5	1881	45	1876, 1882, 1883, 1884	39	1884	29.3	1883	20.9	1884	-4	1880	-15	1880	-27	1881, 1882
34	1875, 1879	42	1875	38	1875	26	1883	17	1878	-9	1880	-23	1880	-32	1875
40	1878, 1879	40	1873	42.5	1875	30	1879	26	1876	Zero.	1880	-12	1884	-24	1875
35.7	1883	46.8	1883	41.8	1884	34	1883	24	1883	8.4	1883	-5	1884	-20.2	1884
31	1881	40.3	1883	34.7	1883	28	1883	18	1878	0	1875	-20	1880	-27	1875
37	1877	46.5	1884	46	1875, 1879	31	1879	23.8	1884	-6	1880	-14	1880	-20	1875
40	1875	50	1873	51.1	1884	37	1872, 1876	26	1873	-2	1872	-23	1872	-23	1872
40	1875, 1879, 1882	50	1875, 1876, 1880, 1883	42	1875	32	1876	22	1878	-5	1880	-21.6	1884	-25	1875
36	1875, 1876	46	1875	45	1876	30	1879, 1883	8	1878	-29	1875	-34	1879	-38	1875
39	1876, 1877	46	1873	43	1875	30	1873	15	1876	-24.5	1875	-30	1879	-39	1879
40	1876	52	1880, 1883	44	1875	31	1873	18	1873	-21	1875	-37	1872	-43	1873
43	1876, 1882	50	1884	44.5	1884	36	1879	18	1873	-3	1875	-17	1872	-27	1884
44	1882	52	1882	48	1879, 1883	34	1879	15	1878	Zero.	1880	-18.2	1884	-30.4	1884
40	1877	50.4	1882	41	1875	33	1873	20	1873	-9	1875	-19	1876, 1879, 1880	-31	1875
45	1877	56	1873, 1880, 1883	47	1875	39	1875, 1876, 1883	20	1873	-3	1872	-22	1872	-24.2	1884
50	1877	60	1881	57	1880	42	1876	24	1873	7	1872	-7	1872	-16	1884
48.7	1883	54	1883	48.9	1884	38	1879	26	1880	6	1880	-14	1880	-22.3	1884
48	1877	57	1876	54	1884	40	1875	26	1873	5	1872	-17	1872	-21.5	1884
45	1877, 1882	53.5	1882	50	1884	37	1876	19	1873	Zero.	1872	-14	1880	-29	1873
42	1877	51	1873	49	1877	30	1873	15	1878	-6	1875	-17	1879, 1884	-32	1884
33	1882	46	1882	42	1883	27	1883	10	1880	-18	1880	-41.3	1884	-42	1883
34	1883	46	1883	42.7	1883	28.2	1883	21	1881	-12.8	1884	-34.2	1884	-38	1884
37	1875	48	1877, 1882	41	1884	18	1881	9	1874	-18	1875	-30.5	1884	-39	1883
38	1876, 1877, 1879	44	1877	45	1875	26	1876	9	1878	-15	1875	-34	1879	-34	1879
32	1883	43	1883, 1884	38	1882	17	1883	14.9	1884	-15	1881, 1884	-34	1883	-43	1884
29	1883	40	1881, 1883	36	1881	17	1883	10.2	1884	-22	1880	-47.8	1884	-47.8	1884
33	1875	32	1884	39	1875	10	1876	6	1874, 1878	-28	1875	-38	1879	-40	1884
30	1883	37.6	1884	36	1883	18	1883	9	1881	-20	1881	-46	1879	-46	1879, 1883
31	1883	35	1881	37	1881	25	1884	-16	1881	-25	1880	-50	1884	-50	1884
37	1881	37	1874	34	1881	14	1873	-6	1881	-31	1875	-59	1880	-59	1880
30	1883	41	1883	36	1883	29	1880	10	1879	-24	1880	-47.5	1884	-47.5	1884
31	1880	38	1880	34	1880	30	1880, 1882	10	1881	-17	1880, 1881	-40	1880	-40	1880
33	1883	37	1884	30	1883	25.7	1884	14	1883	-16	1883	-30	1884	-35	1883

Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Northern Slope—Continued:										
Shaw, Fort, Mont	-33	1883	-37	1883	-22.5	1884	-4	1880	21	1881
Deadwood, Dak	-30	1883	-32	1883	-7.2	1884	11	1880,	21	1883
								1881		
Cheyenne, Wyo	-38	1875	-28.2	1884	-17	1880	2	1875	22	1884
North Platte, Nebr	-27	1881	-29	1883	-21	1880	12	1875	30	1875
Middle Slope:										
Denver, Colo	-29	1875	-23	1883	-10	1880	4	1876	27	1872,
										1873
Pike's Peak, Colo	-37	1883	-37	1875	-29	1875	-21	1875	-8	1875
West Las Animas, Colo	-21.5	1883	-22.7	1884	6	1882	18	1882	27.5	1884
Dodge City, Kans	-20	1883	-20	1883	-8	1880	13	1881	32	1884
Reno, Fort, Ind. T.	-4	1884	-2	1884	14	1883	31	1884	37	1884
Elliott, Fort, Tex	-12	1883	-10	1883	-2	1880	20	1881	36	1884
Southern Slope:										
Sill, Fort, Ind. T	-9	1879	-8.5	1883	10	1880	26	1881	42.5	1883
Concho, Fort, Tex	-1	1881	6	1883	16	1880	29	1882	46	1873
Davis, Fort, Tex	Zero.	1881	9	1883	17	1880	25	1882	40	1880,
										1884
Stockton, Fort, Tex	2	1881	8	1883	15	1880	24.2	1882	41.5	1882
Southern Plateau:										
Santa Fé, N. Mex.	-13	1883	-8	1879,	Zero.	1880	11	1875	24	1880
				1880						
El Paso, Tex	5	1881	12	1881	21	1880	29	1882	30.5	1884
Apache, Fort, Ariz	-6	1883	-9	1880	11	1881	15	1883	29	1880,
										1883
Grant, Fort, Ariz	10	1883	17	1883	21	1882	29	1879	37	1882
Phoenix, Ariz	12.2	1883	19.1	1884	28	1881	30.1	1883	36.3	1884
Prescott, Ariz.	-17	1880	-11	1880	-8	1876	13	1878	26	1877
San Carlos Agency, Ariz	16	1882	21	1882	22	1882	30	1883	38	1884
Thomas, Camp, Ariz	10	1884	16	1881	23	1881	24.3	1883	36.9	1884
Verde, Fort, Ariz	1.4	1883	10	1880	11	1881	27	1883	37	1880
Wickenburg, Ariz	13	1881	10.8	1882	20	1880	30	1878,	38	1880
								1880		
Yuma, Ariz.	22.5	1883	25	1880	31	1881	40	1878	48.9	1884
Middle Plateau:										
Winnemucca, Nev	-23	1883	-19.5	1883	-3	1882	17	1883	29	1879
Salt Lake City, Utah	-20	1883	-18	1884	4	1874	19	1875	33	1880
Northern Plateau:										
Boise City, Idaho	-27	1883	-12	1883	9	1882	17.5	1883	29	1878
Cœur d'Alene, Fort, Idaho	-29	1883	-21	1883	Zero.	1884	20	1882	23	1884
Lewiston, Idaho	-14.2	1883	17.8	1884	12	1880	30	1880	35	1881
Dayton, Wash	-23.5	1883	-24	1883	8	1880	31	1880	30	1881
Spokane Falls, Wash	-27.7	1883	-25.1	1883	7	1882	26	1881	29	1881
North Pacific Coast:										
Canby, Fort, Wash	32.3	1884	16	1884	33.5	1884	40.9	1884	42.6	1884
Olympia, Wash	9	1883	2	1884	23	1880	28	1880	30	1883
Portland, Oreg	3	1875	7	1883	25.5	1880	28	1875	33	1878
Roseburg, Oreg	12	1883	3.3	1884	19	1880	29	1878	33	1880
Middle Pacific Coast:										
Cape Mendocino, Cal	31	1883	28.5	1884	36	1884	36	1883	38	1883
Red Bluff, Cal	19	1883	22	1884	28	1880	34.9	1882	37	1879
Sacramento, Cal	23	1883	21	1884	29	1880	30.8	1883	39	1880

the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
26	1883	37	1883	33	1883	21	1884	2	1881	26.5	1880	44.5	1884	44.5	1884
33	1880	42	1880, 1883	40	1882	28	1884	5	1880	16	1880	28	1884	32	1883
28	1876	37.6	1882	34	1876	23	1878	4	1878	20	1875	24	1879, 1880	38	1875
33	1876	45	1877, 1882	42	1876	21	1876	11	1878	10	1877	27	1879	29	1883
37	1883	42	1878	44	1876	28	1873	1	1873	18	1877	25	1876	29	1875
3	1882	15	1876	15	1882	6	1876	17	1878	36	1880	37	1878	37	1875, 1876, 1883
40.5	1883	52	1882	49.5	1882	35	1883	19	1883	1	1882	21.5	1884	22.7	1884
40	1879	50	1877	50	1880	30	1876	10	1878	7	1880	15	1876	20	1883
32	1883	57	1883	52	1884	40	1883	28	1883	17	1883	2.5	1884	4	1884
44	1880, 1882	49	1880	48	1880, 1882	37	1880	26	1880	5	1880	10	1879	12	1883
47	1879	56	1877, 1880	53	1880	44	1878	25	1878	4	1880	2	1879, 1880, 1884	9	1879
49	1879	60	1877, 1880	54	1880	45	1882	32	1878	12	1880	6	1880	1	1881
49	1881	53	1881	47	1882	37	1883	30	1880	6	1880	1	1880	Zero.	1883
46	1877	50	1877	51	1882	40	1883	29	1877	12	1880	8	1880	2	1881
33	1877, 1880	46	1872, 1880	40	1882	27	1880	16	1880	11	1880	13	1879	18	1879, 1883
50	1881	56	1880	52	1880	42	1880	28	1882	11	1880	5	1880	5	1880
36	1880, 1882	41	1879	41	1880	32	1880, 1882	19	1880	9	1880	8	1884	9	1880
51	1882	56	1880	55	1882	47	1881	33	1881	20	1880	18	1880	10	1883
43	1879	62	1879, 1880	52.3	1884	39.1	1884	33.6	1883	24	1880	18	1879	13.2	1883
32	1880	42	1879	38	1876	29	1881	18	1880	1	1880	18	1879	18	1879
43	1882	54	1882	55	1884	42	1882	29	1881, 1882	17	1881	18	1881	16	1882
45	1880	52	1880	49	1880	42.9	1884	26	1880	16	1880	17	1884	10	1884
42	1884	48	1879	49	1884	34	1881	27.3	1881	8	1880	6	1879	1.4	1883
45.5	1884	40	1878	43.5	1884	41	1884	23	1877	19	1880	13	1878	10.8	1882
56	1878	61	1879	64	1879	50	1882	41.4	1883	31	1880	27	1879	22.5	1883
29	1880	37	1877, 1878	32	1880	22	1880, 1881	10	1878	9	1880	20	1879	23	1883
37	1875	45	1880	44	1880	36	1881	23	1878	3	1880	10	1879	20	1883
36	1882	40	1883	39	1881	30	1881, 1882	19	1878	7	1880	7.8	1884	27	1883
38	1883	29	1884	37	1882	30	1882	17	1881	Zero.	1881	21	1884	29	1883
43	1880	48	1880, 1881, 1882	45	1882	34	1883	28	1881	13	1880	16	1879, 1884	17.8	1884
35.5	1883	37.4	1881	36	1883	29	1881	19	1881	5	1881	26	1884	26	1884
30	1882	42.6	1884	38	1881, 1882	31	1881	18	1881	3	1881	17.6	1884	27.7	1883
47.6	1884	51	1884	50.6	1884	42.5	1884	40.2	1883	33.5	1883	21	1884	16	1884
36	1880	40	1883	41	1880, 1882	31	1877	23	1881	21	1882	8	1879, 1884	3	1884
29	1875	46	1875, 1880	43	1876	39	1878, 1877, 1882	31	1877	32.5	1880	3	1879	3	1875, 1879
37.5	1880	40	1879	40.5	1882	34.6	1881	22.5	1881	17.5	1880	7	1879	3.3	1884
43	1883	45	1883	46	1883	45	1882, 1884	42	1882	33	1882, 1883	34	1884	23.5	1884
47	1880	53	1881	52	1881	40.5	1884	32	1881	26	1880	25	1878, 1879, 1882, 1883, 1884	19	1883
48	1881	51	1879	49	1880	44.4	1882	36.4	1881	27	1880	23.5	1878	21	1884

Lowest temperature (in degrees Fahrenheit) and year in which it occurred at stations of

Stations.	January.		February.		March.		April.		May.	
	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
Middle Pacific Coast—Continued:										
San Francisco, Cal	36	1876	35	1883, 1884	39	1890	40	1875	45	1876, 1879, 1890, 1882
South Pacific Coast:										
Los Angeles, Cal	30	1880, 1883	28	1883	25.3	1882	30	1883	39.5	1883
San Diego, Cal	32	1880	35	1890	38	1890	39	1875	45.4	1883
Alaska stations:										
Alexander, Fort, Alaska	-18	1882	-26	1882	-6	1882	6	1882	23	1882
Atka, Alaska	20	1882, 1883, 1884	19	1882	15	1883	21	1884	24	1883
Hoonah, Alaska	3	1882	Zero.	1882	Zero.	1822	23	1884	29	1882
Pyramid Harbor, Alaska	-13	1882	-13	1882	-13	1882	14	1882	30	1882
Saint Michael's, Fort, Alaska	-47	1878	-52	1878	-39	1878	-27	1880	-2	1876, 1879
Sitka, Alaska	8.5	1882	4	1882	5.5	1882	25.5	1882	31	1881
Unalashka, Alaska	16	1884	7	1879	5	1883	15	1884	24	1882
Behring's Island, Behring Sea....	6.3	1884	9.5	1884	12.2	1884	0.6	1884	27.4	1884

the Signal Service, United States Army, for each month and the year, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.		Lowest on record.	
°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.	°	Year.
46	1871, 1872, 1874	49	1874, 1881	50	1875, 1879, 1882	50	1874, 1880, 1881, 1882	45	1881	41	1880	34	1879	34	1879
47	1878	51.2	1881	50	1883	44	1880	42.5	1879	34.2	1881	30	1878, 1879	26	1883
50	1884	53.7	1884	54	1879, 1884	49.5	1882	44	1878	38	1881	32	1879	32	1879, 1880
32	1884	36	1884	30	1884	21	1884	9	1882	—5	1884	—29	1881	—29	1881
30	1879	35	1883	39	1883, 1884	34	1884	28	1882	22	1882, 1883	12	1881	12	1881
25	1882	40	1882, 1883	38	1884	30	1882	25	1883	15	1883	1	1882	Zero.	1882
27	1882	43	1883	39	1882	32	1882, 1883	21	1882	9	1881	—9	1882	—13	1882
22	1881	38	1881	31.5	1884	18	1884	3	1879, 1880	—24	1876	—43	1880	—52	1878
38	1882, 1883	43	1881, 1882	42.5	1883	32	1884	26	1883, 1884	5	1883	9	1882	4	1882
34	1883	37	1881	36	1882	33	1883	24	1879	19	1883	12	1882	5	1883
31.3	1882	36.1	1883	38.2	1884	30.4	1884	19.2	1883	13.4	1884	1.4	1882	0.6	1884

APPENDIX 16.

Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, United States Army, for the year ending December 31, 1884.

[The daily mean is generally obtained by dividing the sum of the 7 a. m., 2, and twice the 9 p. m. (local time) observations by 4; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
Accotink, Va	81.8	43.3	44.9	53.6	66.4	75.1	76.5	78.3	72.6	61.1	48.1	38.9	57.1
Alken, S. C.	40.3	55.3	58.1	60.7	75.7	(1)	(1)	(1)	(1)	(1)	53.7	48.6	
Albany, Oreg.	38.9	37.0	45.0	52.7	59.7	61.5	63.3	68.2	53.3	52.5	47.4	37.1	50.9
Allison, Kans.	20.4	20.8	35.3	44.5	57.1	71.0	74.3	68.0	66.5	54.0	34.5	16.9	46.9
Altosna, Pa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	71.1	57.4	44.4	33.6	
Amherst, Mass.	21.6	30.5	31.0	45.5	56.6	66.7	67.9	69.2	64.4	50.3	38.7	33.2	48.1
Andersonville, Ga.	41.7	(1)	60.0	64.0	74.4	(1)	79.3	81.7	77.1	49.5	(1)	(1)	
Anna, Ill.	25.6	33.7	45.7	54.7	65.5	73.7	77.7	75.2	74.6	64.6	47.4	32.5	56.3
Ann Arbor, Mich.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	65.4	(1)	34.4	(1)	
Archer, Fla.	62.0	65.6	68.2	69.0	80.3	79.1	81.9	79.5	77.7	73.9	62.0	63.1	71.1
Ardens (Phillipstown), N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	73.5	62.4	(1)	(1)	(1)	
Ashville, N. C.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	46.0	41.6	
Ashwood, Tenn.	29.0	46.4	50.5	58.0	70.0	76.0	79.5	78.0	72.0	61.0	48.0	32.5	56.4
Atchison, Kans.	(1)	25.0	39.3	50.2	62.5	71.0	76.4	72.1	72.0	58.7	40.6	22.2	
Athens, Ga.	(1)	(1)	(1)	67.4	72.4	70.6	73.8	75.2	74.8	67.1	49.1	44.8	
Auburn, N. Y.	17.5	26.0	30.0	43.3	58.5	69.0	66.5	63.2	64.5	51.6	32.7	30.7	47.2
Austin, Tenn.	28.2	47.0	49.0	56.7	68.6	(1)	77.6	73.8	73.8	65.7	46.1	41.5	
Austin, Tex.	(1)	(1)	(1)	(1)	73.9	82.7	83.3	84.8	83.2	70.8	58.0	49.5	
Bainbridge Island, Wash.	39.0	34.0	43.0	51.3	52.0	60.0	62.2	(1)	54.0	61.1	47.2	(1)	
Beloit, Wis.	10.2	20.1	29.4	44.7	57.9	66.5	68.5	66.5	66.4	52.0	32.2	18.7	44.4
Blooming Grove, Pa.	20.9	(1)	(1)	(1)	57.6	72.1	74.8	71.2	71.3	(1)	38.9	29.6	
Blue Lake, Cal.	(1)	(1)	(1)	(1)	(1)	60.3	61.7	69.7	55.6	55.0	50.9	41.1	
Bowling Green, Ky.	26.4	(1)	44.8	(1)	(1)	(1)	74.6	(1)	(1)	(1)	42.7	(1)	
Boyne, Mich.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	33.5	22.6	
Breward, N. C.	34.9	46.5	48.6	53.5	65.0	68.1	(1)	70.5	63.0	59.9	43.3	42.9	
Bunker Hill, Ill.	18.8	31.0	39.8	50.6	61.9	70.9	73.8	70.1	71.4	57.2	(1)	21.7	
Burlington, Vt.	13.5	25.0	29.9	43.8	55.8	70.7	(1)	(1)	65.2	48.7	36.1	26.8	
Carson City, Nev.	30.2	36.0	38.8	46.1	57.5	61.2	69.6	68.0	55.8	48.6	38.7	35.6	48.0
Carthage, Mo.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	62.1	49.0	30.0	
Catawissa, Pa.	21.2	30.8	32.2	59.0	62.0	66.5	71.8	69.0	67.2	55.0	40.8	31.8	49.8
Cedar Rapids (W.), Iowa.	8.9	17.0	23.4	43.5	57.7	67.8	(1)	(1)	(1)	(1)	30.1	(1)	
Chambersburg, Pa.	23.1	32.8	38.9	47.4	58.6	(1)	70.1	69.7	66.6	53.5	36.1	31.5	
Chapel Hill, N. C.	38.0	49.6	51.4	56.5	69.2	72.5	76.7	75.6	73.2	65.2	50.9	43.2	60.0
Charlotte, Vt.	11.0	22.5	26.5	42.5	56.8	68.6	67.9	62.5	69.0	48.2	34.8	23.9	44.5
Cincinnati (G. W. H.), Ohio.	27.0	39.0	43.6	52.4	67.4	75.0	75.8	74.9	73.6	61.0	43.7	31.6	55.7
Clarksville, Tex.	34.9	47.4	56.8	60.5	69.0	76.8	83.7	80.4	80.1	67.3	54.4	41.6	62.9
Clay Centre, Kans.	21.3	24.9	(1)	(1)	(1)	73.6	78.8	71.8	72.5	58.9	40.5	21.5	
Cleburne, Tex.	(1)	47.0	57.2	60.0	68.3	75.2	84.2	86.0	81.1	65.7	51.1	38.2	
Cleveland, Ohio.	20.1	30.7	34.4	44.6	58.5	69.0	68.9	67.9	(1)	55.1	39.3	30.9	
Clinton, Ind.	(1)	(1)	(1)	(1)	60.4	74.4	73.0	70.9	(1)	(1)	(1)	(1)	
College City, Cal.	47.2	48.9	55.0	62.9	71.9	73.4	78.0	78.5	67.0	61.7	53.9	48.6	62.3
College Hill, Ohio.	23.0	38.4	42.3	52.3	64.0	74.8	70.4	70.0	73.6	62.3	46.2	31.8	54.1
Collinsville, Ill.	21.1	32.9	39.9	51.8	62.5	72.3	73.9	72.8	72.3	60.4	43.0	29.3	52.6
Conception, Mo.	12.7	22.3	35.6	48.1	58.0	71.8	74.6	68.2	68.7	56.8	40.7	18.2	48.0
Contoocook, N. H.	(1)	(1)	31.2	(1)	56.1	69.0	69.4	53.5	(1)	49.1	(1)	27.9	
Cooperstown, N. Y.	17.7	27.5	28.3	40.8	54.0	65.7	64.5	66.5	61.6	48.3	36.0	27.0	44.8
Cornish, Me.	16.1	24.5	(1)	(1)	(1)	68.3	65.2	(1)	61.7	46.6	34.2	(1)	
Cresco, Iowa.	5.5	11.3	25.3	43.2	56.0	67.1	66.3	65.2	63.9	49.0	28.6	10.2	40.9
Crete, Nebr.	16.2	19.5	34.6	46.0	59.4	69.4	73.2	68.7	67.7	55.7	36.5	14.1	46.8
Cumberland, Md.	26.6	36.4	40.8	49.0	61.4	68.7	70.5	69.9	68.6	56.8	41.9	33.2	52.0
Dale Enterprise, Va.	(1)	(1)	(1)	(1)	(1)	(1)	71.5	72.0	70.8	59.2	41.3	34.2	
Des Moines, Iowa.	14.4	19.5	33.3	49.3	59.4	69.1	(1)	(1)	67.9	55.7	35.8	18.4	
De Soto, Nebr.	14.6	17.3	33.4	41.0	60.4	71.2	73.0	69.2	67.0	54.7	36.5	14.7	46.1
Dillingersville, Pa.	(1)	(1)	(1)	(1)	(1)	62.0	67.2	(1)	70.7	51.6	(1)	(1)	
Distributing Reservoir, D. C.	29.6	42.3	43.7	52.2	66.9	75.6	77.0	77.1	73.9	61.2	44.8	36.3	56.7
Dorset, Vt.	15.6	27.1	28.6	41.2	54.4	63.2	64.3	65.4	61.8	46.4	35.1	25.3	43.9
Drifton, Pa.	(1)	27.3	29.0	40.5	58.7	65.7	64.1	66.3	63.1	49.4	37.6	30.6	

¹No record.

Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
Dyberry, Pa.	17.3	27.9	29.5	41.7	55.3	66.8	65.2	65.6	60.8	49.0	35.2	27.5	45.2
Easton, Pa.	(1)	(1)	(1)	(1)	64.1	74.0	74.7	77.9	71.4	56.2	42.3	34.3	.....
Elk Falls, Kans.	18.0	26.0	34.0	38.0	(1)	(1)	70.0	(1)	(1)	(1)	(1)	(1)	.....
Embarras, Wis.	6.8	12.6	30.1	43.6	58.6	69.5	67.8	67.2	64.6	51.7	31.9	17.4	43.4
Emmitsburg, Md.	(1)	(1)	38.5	49.8	62.0	(1)	(1)	(1)	(1)	54.5	42.5	32.8	.....
Emporia, Kans.	(1)	28.1	(1)	49.9	62.2	(1)	77.8	71.7	73.1	61.6	43.3	22.4	.....
Eola, Oreg.	36.9	34.8	44.2	51.5	57.9	60.0	61.6	67.2	52.3	51.4	44.7	30.7	49.4
Factoryville, N. Y.	19.0	20.8	31.8	48.2	55.2	66.8	65.6	67.2	64.0	49.6	35.9	23.2	46.4
Fall Brook, Cal.	51.4	53.6	52.4	(1)	(1)	(1)	(1)	(1)	(1)	60.1	52.0	50.4	.....
Fall River, Mass.	24.3	31.2	33.6	41.3	54.3	63.3	66.2	67.5	61.2	51.4	42.2	33.0	47.5
Fallsington, Pa.	26.1	37.1	39.9	49.5	61.2	70.5	71.9	71.9	69.6	54.6	40.6	32.9	52.2
Fallston, Md.	26.1	37.4	38.7	48.0	60.5	68.3	71.0	71.2	69.4	56.4	42.9	34.0	52.0
Payetteville, Ark.	26.8	38.3	46.4	55.0	62.6	71.0	77.0	71.0	(1)	(1)	(1)	(1)	.....
Forsyth, Ga.	(1)	56.3	(1)	62.9	74.5	74.2	81.4	79.5	82.2	73.8	56.3	49.3	.....
Fort Collins, Colo.	23.4	(1)	35.0	45.8	58.3	(1)	70.8	(1)	(1)	48.7	34.7	(1)	.....
Fort Scott, Kans.	22.2	32.2	(1)	55.5	65.1	76.0	83.9	74.4	(1)	(1)	(1)	(1)	.....
Fort Wayne, Ind.	20.0	30.0	39.0	48.0	60.0	71.0	72.1	71.0	69.5	56.0	39.8	29.0	50.4
Frankfort, Ky.	23.9	41.6	(1)	52.7	64.0	72.8	(1)	72.1	71.4	60.2	(1)	35.3	.....
Franklin, Pa.	15.3	28.1	30.4	(1)	52.2	63.4	61.5	61.5	59.5	47.2	32.5	25.2	.....
Freemont, Nebr.	13.8	16.2	32.4	(1)	60.2	74.6	72.0	(1)	65.4	49.7	34.7	12.8	.....
Garfield, Mo.	(1)	25.5	27.8	43.0	51.2	64.1	65.0	64.4	59.8	48.2	36.0	26.8	.....
Garrettsville, Ohio.	(1)	30.8	35.0	44.8	57.9	67.8	68.0	66.9	66.3	53.6	37.7	23.8	.....
Genoa, Nebr.	14.2	14.1	31.8	44.0	50.8	71.3	73.3	69.5	61.2	54.8	36.0	12.0	45.2
Grampan Hills, Pa.	17.0	28.0	30.7	41.0	53.5	65.9	66.6	68.0	66.0	51.7	35.7	25.6	45.8
Grand Coteau, La.	47.5	62.0	66.1	67.5	75.5	80.8	85.6	81.3	81.3	72.5	57.3	57.7	69.6
Grand Junction, Colo.	(1)	(1)	(1)	48.3	(1)	(1)	72.0	(1)	63.5	(1)	(1)	(1)	.....
Great Falls Reservoir, Md.	(1)	(1)	40.8	49.5	63.9	72.7	74.6	74.0	70.8	59.0	43.9	36.8	.....
Green Springs, Ala.	37.6	52.2	57.0	61.0	71.3	73.5	80.0	77.3	76.2	68.4	49.8	(1)	.....
Guttenberg, Iowa	8.1	17.7	27.2	46.2	57.2	67.0	67.1	66.2	(1)	52.2	30.2	15.2	.....
Hartford, Conn.	(1)	(1)	(1)	(1)	57.5	63.8	69.6	70.2	65.2	50.8	38.7	30.0	.....
Helvetia, W. Va.	26.1	40.6	41.0	46.4	57.8	67.5	66.6	66.1	63.8	54.0	40.1	35.8	50.4
Higdonia, N. C.	26.8	39.0	42.1	45.3	60.0	61.2	66.6	64.2	59.8	53.5	36.5	26.3	49.3
Hiram, Ohio.	(1)	34.8	36.3	43.8	(1)	71.7	70.6	70.1	67.3	53.7	36.9	23.2	.....
Holton, Kans.	19.0	23.0	42.0	(1)	(1)	(1)	(1)	(1)	(1)	41.0	21.0	.....	.....
Hudson, Mich.	15.1	27.2	(1)	(1)	(1)	68.9	69.8	64.8	66.2	53.1	33.7	24.3	.....
Hulmeville, Pa.	24.6	35.6	(1)	(1)	62.7	70.1	71.9	74.0	(1)	(1)	(1)	(1)	.....
Humboldt, Iowa.	6.3	9.8	26.8	42.6	55.2	66.2	67.2	65.8	62.8	49.6	28.6	3.6	40.4
Hamphrey, N. Y.	18.0	25.2	29.7	37.2	54.0	66.2	62.3	65.6	64.2	48.1	35.1	24.2	44.2
Hydesville, Cal.	46.2	44.4	48.5	51.7	55.8	60.0	58.4	59.8	57.6	55.6	54.5	(1)	.....
Independence, Iowa.	9.3	16.5	29.0	46.7	58.6	67.0	69.4	67.6	64.0	(1)	32.6	15.4	.....
Independence, Kans.	22.0	31.0	44.1	52.5	63.8	73.1	73.3	72.8	73.9	60.8	45.6	25.4	53.6
Indianola, Iowa.	15.1	20.8	35.4	49.3	61.2	70.0	72.0	69.7	67.8	55.9	37.5	18.0	47.7
Ionia, Mich.	16.0	22.7	30.6	43.8	56.4	68.0	67.4	65.4	64.3	50.6	34.6	24.7	45.4
Ithaca, N. Y.	19.5	28.6	30.4	41.5	56.0	68.6	68.6	64.6	64.6	50.9	37.5	29.2	46.8
Jacksonburg, Ohio.	19.1	38.0	39.9	49.8	59.9	75.0	74.3	73.7	(1)	57.8	40.3	27.4	.....
Jeffersonville, Ind.	(1)	39.1	44.0	53.2	64.3	73.3	75.0	72.9	68.5	60.6	49.6	34.2	.....
Johnsontown, Va.	36.1	47.4	49.2	52.6	(1)	75.1	78.7	78.5	76.8	66.7	52.0	44.1	.....
Kelley's (near Raleigh), N. C.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	78.0	73.0	66.9	51.0	45.9	.....
Laconia, Ind.	23.0	39.7	44.0	52.8	64.2	70.3	75.3	72.5	71.5	60.5	44.2	33.6	51.8
Lafayette, Ind.	17.6	29.5	37.1	47.9	59.5	71.7	71.4	69.8	68.8	55.2	37.6	25.8	49.3
Lansing, Mich.	16.5	23.9	32.3	45.3	58.2	70.7	70.0	68.6	68.0	53.5	36.5	28.0	47.5
Lawrence, Kans.	31.0	28.0	41.6	45.8	62.2	71.1	(1)	(1)	70.4	57.9	41.5	23.5	.....
Lead Hill, Ark.	25.8	38.1	48.7	56.7	67.8	76.4	81.6	76.2	76.4	63.2	47.4	29.1	57.3
Leetadale, Pa.	21.9	33.0	35.9	45.5	50.5	69.3	69.0	66.7	60.2	48.3	37.2	29.5	48.2
Le Roy, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	66.5	62.4	53.6	40.1	28.1	.....
Limona, Fla.	(1)	63.6	(1)	71.0	78.9	78.7	81.4	80.5	79.3	74.3	70.8	65.9	.....
Lincolnton, N. C.	(1)	(1)	(1)	(1)	(1)	69.8	76.7	73.5	70.6	67.1	36.3	37.4	.....
Logan, Iowa.	(1)	21.3	36.7	(1)	64.5	71.3	(1)	70.8	69.1	53.7	38.6	17.1	.....
Logansport, Ind.	18.6	29.3	37.6	48.9	62.0	71.6	72.5	71.8	70.4	59.2	40.4	26.8	50.8
Luling, La.	(1)	(1)	(1)	(1)	(1)	78.1	82.5	78.2	75.0	(1)	55.2	(1)	.....
Lunenburg, Vt.	9.1	21.8	24.8	39.2	51.5	65.5	64.6	64.8	58.4	43.6	30.6	21.6	41.2
Madison, Nebr.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	41.4	15.0	.....	.....
Madison, Wis.	9.2	18.9	27.4	43.4	57.1	66.0	67.7	66.6	65.1	51.5	32.2	16.8	43.3
Manatee, Fla.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80.8	81.4	78.9	71.2	69.8	.....
Manchester, Iowa.	(1)	18.3	29.9	48.3	60.0	63.0	71.5	68.5	68.0	53.6	34.2	17.0	.....
Manhattan (B), Kans.	(1)	24.8	39.5	51.0	63.1	(1)	78.8	73.6	74.8	59.4	(1)	(1)	.....
Manistiquie, Mich.	10.1	(1)	23.1	38.1	48.6	60.3	60.7	61.1	58.8	49.0	30.6	21.6	.....
Manitowoc, Wis.	13.2	20.8	29.0	41.2	52.6	62.3	67.5	64.9	62.7	51.3	(1)	22.3	.....
Margaretta Township, Ohio.	23.7	26.3	36.0	40.5	64.3	72.0	66.1	71.7	69.0	59.5	48.8	(1)	.....
Marion, Va.	37.0	42.5	45.0	49.0	62.0	67.0	71.0	70.0	69.0	58.5	42.7	35.6	53.3
Marquette, Nebr.	21.2	22.4	(1)	51.2	67.1	80.0	80.2	78.3	(1)	(1)	(1)	19.5	.....
Mattoon, Ill.	31.0	33.5	41.0	51.0	66.0	72.0	74.4	72.7	73.0	57.0	42.0	28.6	52.7
Maude, Kans.	(1)	(1)	(1)	50.6	(1)	(1)	(1)	(1)	76.9	(1)	(1)	(1)	.....

¹No record.

Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
Maynard, Iowa.....	o	o	o	o	o	o	o	o	o	o	o	o	o
Mayport, Fla.....	53.3	63.7	67.4	69.2	75.6	76.8	81.4	80.2	80.1	78.5	65.8	62.1	71.0
Mazatlan, Mex.....	69.8	70.8	(1)	70.8	75.8	82.8	83.4	82.5	82.4	79.4	75.7	72.1	78.1
McDonough, Md.....	(1)	33.8	38.9	49.4	56.2	70.5	69.9	71.5	65.9	(1)	41.4	33.9	50.0
McNard Station (near Albany), N. Y.....	17.9	23.4	31.5	45.5	57.4	70.4	68.6	70.9	66.1	51.4	38.5	27.5	47.6
Mendon, Mass.....	21.5	29.9	31.2	48.4	56.6	60.4	68.3	68.3	65.7	51.1	38.8	30.6	47.9
Milan, Tenn.....	35.6	44.0	48.7	56.0	66.2	72.4	77.2	74.3	73.8	62.3	45.5	37.4	57.2
Milledgeville, Ga.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Milton, Mass.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Minneapolis, Minn.....	2.8	8.8	23.0	43.2	57.0	67.8	(1)	67.2	61.6	48.4	27.0	8.6	34.5
Monticello, Iowa.....	3.4	18.1	29.2	46.6	58.6	68.2	70.1	67.0	66.6	51.8	32.0	15.8	44.5
Moorestown, N. J.....	25.0	30.6	38.6	47.8	60.4	69.0	72.1	71.4	68.8	55.4	41.2	32.0	51.7
Mountainville, N. Y.....	23.7	31.3	33.8	44.9	(1)	68.4	68.1	69.1	65.5	52.2	38.5	29.5	47.0
Mount Forest, Can.....	31.5	23.0	36.0	43.0	54.0	67.5	65.0	65.5	59.5	51.0	32.5	31.0	47.0
Mount Ida, Ark.....	32.5	43.2	50.5	57.3	65.5	75.3	81.0	75.5	75.5	63.0	49.0	38.2	58.8
Mount Vernon, Iowa.....	10.0	19.4	31.8	50.1	63.0	73.0	78.7	(1)	(1)	56.9	34.7	17.2	45.8
Muscataine, Iowa.....	10.4	21.1	32.5	46.9	57.8	69.8	69.9	67.3	65.8	55.8	35.8	19.3	45.8
Neillville, Wis.....	1.8	8.5	22.0	38.4	52.0	63.3	61.5	59.4	57.0	43.7	22.0	6.9	36.4
Nephi, Utah.....	22.5	25.0	35.5	42.2	51.3	63.8	66.9	64.3	54.8	40.1	33.2	20.4	44.7
New Athens, Ohio.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	70.1	(1)	55.0	39.0	30.0	47.0
New Bedford, Mass.....	20.1	33.1	(1)	(1)	(1)	(1)	66.8	67.0	64.4	52.1	40.9	33.4	43.5
Newport, Fla.....	46.6	58.0	57.6	65.3	(1)	(1)	(1)	66.7	55.0	(1)	56.5	57.3	57.3
Newport, Vt.....	10.9	22.9	26.8	41.1	54.2	66.1	65.9	68.2	62.9	46.0	33.4	21.9	43.5
New Tacoma, Wash.....	(1)	(1)	43.0	(1)	(1)	(1)	(1)	66.7	55.0	(1)	45.7	29.0	47.0
New Ulm, Tex.....	44.0	56.3	63.4	63.5	72.2	79.0	84.2	82.6	80.0	69.5	57.9	(1)	77.0
North Colebrook, Conn.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	34.9	27.3	39.0
Northfield, Minn.....	(1)	(1)	24.7	43.0	57.2	71.0	67.4	62.2	61.6	49.3	28.7	10.1	47.0
North Lewisburg, Ohio.....	15.8	33.0	37.8	48.5	61.5	72.4	76.2	72.3	71.0	60.5	39.2	29.9	51.5
Northport, Mich.....	15.0	22.5	25.5	42.0	56.0	68.1	68.0	(1)	(1)	(1)	(1)	(1)	51.5
North Volney, N. Y.....	16.8	26.3	28.6	40.4	(1)	67.4	64.9	68.5	65.5	50.2	35.9	26.5	47.0
Oakland, Cal.....	47.0	48.3	53.2	54.3	59.3	60.8	63.4	61.5	59.4	56.4	55.4	51.2	65.6
Orou, Me.....	12.1	22.4	27.1	42.5	50.0	64.4	64.2	66.1	58.9	45.3	37.1	23.6	42.8
Ottumwa, Iowa.....	(1)	(1)	32.8	49.6	61.4	73.3	74.0	69.2	68.6	50.7	36.8	18.8	49.8
Palermo, N. Y.....	14.1	23.8	26.6	38.3	52.4	65.1	62.9	66.1	62.0	47.8	33.6	23.5	43.0
Paramaribo (Dutch Guiana), S. A.....	77.5	(1)	(1)	(1)	77.8	78.3	78.4	79.9	80.0	81.1	80.3	78.4	78.4
Pateroson, N. J.....	26.0	35.0	38.0	49.0	60.0	(1)	70.0	(1)	68.0	(1)	(1)	(1)	52.1
Peoria, Ill.....	17.7	29.2	38.3	51.9	63.9	73.0	75.7	74.3	73.3	59.1	41.8	27.3	52.1
Phillipsburg, N. J.....	(1)	36.5	(1)	(1)	73.9	74.4	73.6	69.0	55.6	(1)	32.4	(1)	52.1
Pierce City, Mo.....	23.1	34.8	44.9	52.9	63.4	70.7	75.6	71.4	72.9	(1)	(1)	29.2	47.0
Point Pleasant, La.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	70.5	77.3	68.6	52.0	48.9	52.1
Port Jervis, N. Y.....	20.4	30.1	31.8	45.2	57.7	68.4	68.5	70.1	62.9	48.7	36.7	28.0	47.4
Portsmouth, Ohio.....	23.3	30.9	42.5	51.6	62.0	71.1	72.2	74.5	69.3	58.1	42.4	33.9	53.5
Poway, Cal.....	50.5	(1)	53.8	58.6	61.6	65.2	69.7	72.5	65.0	59.5	54.6	50.0	60.0
Prairie du Chien, Wis.....	(1)	(1)	(1)	(1)	58.9	63.3	68.7	67.2	60.3	51.8	31.2	20.6	47.0
Princeton, Cal.....	46.8	46.9	53.5	(1)	66.3	67.7	74.7	78.9	67.4	63.0	56.4	50.0	60.0
Princeton, Mass.....	18.9	26.3	28.4	40.4	52.2	64.8	64.8	66.0	62.2	47.0	35.3	27.7	44.5
Providence, R. I.....	(1)	(1)	(1)	(1)	(1)	68.0	(1)	66.8	(1)	66.8	53.0	42.9	54.1
Pueblo, Colo.....	29.1	28.9	43.0	47.4	58.2	68.0	75.1	70.5	66.2	54.2	36.5	22.1	49.8
Puerto de Luna, N. Mex.....	(1)	(1)	49.3	(1)	63.6	74.4	82.3	73.6	(1)	58.7	45.1	36.8	60.0
Quakertown, Pa.....	22.6	32.3	34.2	46.1	57.6	66.5	67.6	77.5	(1)	40.0	30.4	(1)	44.5
Raleigh, N. C.....	28.0	(1)	(1)	(1)	69.0	(1)	70.0	77.0	75.0	70.0	(1)	44.5	52.1
Readington, N. J.....	(1)	(1)	(1)	(1)	64.0	78.0	74.0	76.4	73.9	59.8	45.7	38.6	56.9
Receiving Reservoir, D. C.....	29.3	41.8	43.2	52.1	66.4	75.5	77.3	77.0	74.0	61.2	45.8	37.3	56.9
Red Willow, Nebr.....	(1)	(1)	38.0	48.0	61.0	75.0	75.0	73.9	60.0	57.0	53.0	19.0	47.0
Richardson, Dak.....	(1)	(1)	20.8	37.1	55.0	64.7	64.4	64.5	54.6	46.2	30.1	3.2	47.0
Richmond, Ky.....	(1)	(1)	(1)	(1)	64.0	71.4	72.7	71.3	71.6	60.0	44.0	36.1	47.0
Riley, Ill.....	9.8	20.5	29.2	43.7	57.0	66.1	67.4	65.8	65.2	51.5	32.8	19.4	44.6
Ripon, Wis.....	9.0	15.1	28.0	42.7	56.5	67.3	66.6	65.7	(1)	(1)	(1)	(1)	47.0
Rock Creek Bridge, D. C.....	31.1	43.7	45.6	55.6	69.8	78.1	78.9	78.7	74.4	62.7	46.3	38.5	58.6
Rockford, Ill.....	10.8	21.5	29.2	40.6	59.6	67.4	69.2	67.4	66.9	53.2	34.4	21.4	45.6
Rowe, Mass.....	16.8	25.6	2.8	40.2	(1)	63.3	64.7	65.9	60.9	48.1	34.5	26.2	47.0
Ruggles, Ohio.....	19.9	32.7	34.1	44.4	56.7	67.6	67.6	68.6	64.6	53.6	37.3	28.5	39.5
Sacramento, Cal.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	54.8	51.3	45.9	52.1
Salina, Kans.....	22.9	25.2	40.8	49.6	62.4	75.6	79.6	74.8	77.3	(1)	42.0	23.2	47.0
Salinas City, Cal.....	46.3	49.1	52.7	53.9	58.2	59.2	59.5	58.5	57.0	50.6	(1)	47.6	52.1
Sandwich, Ill.....	(1)	24.9	33.7	(1)	60.8	70.5	71.8	70.8	69.9	56.1	35.6	21.6	47.0
Sherlock, Kans.....	(1)	(1)	44.4	49.4	60.3	75.1	81.8	77.0	71.3	59.2	41.0	15.0	49.5
Somersett, Mass.....	24.8	33.0	35.1	44.7	48.1	68.3	71.4	71.8	67.8	54.2	41.2	33.8	49.5
Somerville, N. J.....	23.4	33.6	36.4	47.8	60.6	71.3	71.7	72.6	69.6	54.8	40.0	32.4	51.1
Southington, Conn.....	20.8	20.5	32.5	44.4	56.8	67.2	65.5	68.9	64.7	50.7	36.8	29.4	46.8
South Orange, N. J.....	23.8	33.2	36.4	48.0	59.1	68.1	69.3	69.8	67.7	54.2	41.0	33.0	50.3

¹ No record.

Monthly and annual mean temperatures (in degrees Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
Spiceland, Ind.	(¹)	(¹)	(¹)	(¹)	60.6	71.2	72.2	70.0	70.1	55.9	38.5	27.2	.....
Springfield, Mo.	(¹)	(¹)	(¹)	(¹)	65.5	73.3	80.5	74.2	73.2	59.9	45.6	31.8	.....
Stateburg, S. C.	87.0	48.0	52.5	61.0	69.5	71.0	78.5	75.5	72.0	65.0	51.0	42.5	60.3
Stateville, N. C.	(¹)	(¹)	62.6	57.9	70.5	73.4	76.7	77.7	75.3	67.1	50.1	43.8	.....
Sterling, Kans.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	77.5	70.0	(¹)	(¹)	19.1	.....
Stockham, Nebr.	28.2	(¹)	45.0	56.0	71.2	81.0	87.3	80.6	77.3	68.4	54.2	25.2	.....
Stratford, Vt.	12.6	23.0	25.5	40.5	54.4	67.4	67.5	68.6	62.9	48.2	33.1	23.0	43.7
Summit, Va.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	74.5	73.8	72.5	60.8	43.2	36.4	.....
Sunman, Ind.	20.2	35.1	44.4	49.3	63.8	75.1	78.0	74.7	71.7	57.0	39.5	30.3	53.1
Sussex, Wis.	10.9	17.7	26.8	40.3	54.6	64.7	66.0	65.3	67.6	50.9	33.4	17.9	43.0
Swanwick, Ill.	22.1	33.9	43.4	52.5	63.5	71.8	75.5	70.0	72.3	(¹)	(¹)	29.3	.....
Swarts Creek, Mich.	15.3	22.7	29.4	42.9	55.9	68.0	66.7	65.5	64.8	50.5	33.4	24.4	45.0
Sycamore, Ill.	11.5	22.0	30.8	44.9	56.9	66.3	67.6	65.5	64.8	51.2	32.8	20.5	43.7
Tallahassee, Fla.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	81.5	81.2	(¹)	68.5	56.0	49.0	.....
Tamaqua, Pa.	(¹)	(¹)	(¹)	52.0	67.0	78.0	74.5	76.2	72.0	55.6	40.0	31.0	.....
Taunton, Mass.	24.6	36.3	35.3	45.0	55.7	65.3	68.0	68.7	65.6	52.8	41.4	34.0	49.4
Tecumseh, Nebr.	(¹)	(¹)	(¹)	(¹)	(¹)	71.9	78.0	73.3	72.3	62.8	41.0	19.7	.....
Thornton, Mich.	16.4	24.6	31.0	44.1	58.0	70.1	68.1	68.4	72.1	53.1	35.0	27.4	47.4
Topeka, Kans.	19.6	28.8	42.5	51.3	62.3	77.0	77.2	71.3	73.9	59.0	44.0	23.3	52.5
Troy, Pa.	(¹)	(¹)	31.0	35.5	(¹)	61.8	65.0	66.2	63.0	48.1	35.6	26.0	.....
Variety Mills, Va.	30.5	43.4	44.5	52.1	(¹)	69.3	72.7	71.3	68.9	50.1	42.4	38.1	.....
Vermillion, Dak.	(¹)	(¹)	(¹)	45.0	64.5	(¹)	(¹)	(¹)	(¹)	(¹)	35.0	(¹)	.....
Vevay, Ind.	23.0	40.2	45.0	52.1	64.3	73.9	74.8	73.0	72.4	62.3	45.1	34.0	55.0
Vinceland, N. J.	28.1	40.2	41.4	(¹)	64.9	(¹)	75.3	72.9	69.5	58.2	43.2	37.7	.....
Wabash, Ind.	18.7	30.5	37.3	47.9	61.6	71.1	73.2	71.0	70.5	56.7	38.6	26.0	50.3
Wausau, Wis.	(¹)	10.7	24.3	40.5	55.1	65.1	64.5	63.2	60.5	47.7	26.9	14.1	.....
Wauson, Ohio	14.5	26.2	33.1	44.9	58.3	69.5	70.1	68.4	67.8	53.2	35.5	24.5	47.2
Webster, Dak.	1.7	-0.3	18.8	29.8	57.6	76.6	73.1	71.8	62.2	52.3	34.9	9.1	40.6
Weldon, N. C.	34.7	48.3	49.6	55.2	68.7	72.3	76.8	75.4	74.7	63.7	46.9	41.6	57.3
Wellington, Kans.	23.9	26.6	41.6	50.7	60.3	71.5	78.4	70.1	74.5	60.6	42.9	23.1	62.0
Wellsville, Pa.	19.1	13.3	(¹)	43.6	58.0	68.3	68.7	67.2	63.5	51.2	39.0	30.0	.....
Westborough, Mass.	22.4	31.5	34.4	45.7	58.7	67.8	71.7	(¹)	67.2	51.6	29.4	33.0	.....
West Chester, Pa.	24.3	35.1	36.9	46.7	69.4	69.1	70.0	69.6	68.6	54.6	41.2	32.9	51.5
Westerville, Ohio	17.4	33.5	36.9	47.4	59.0	69.9	72.0	68.5	66.8	53.9	38.2	29.3	49.4
West Leavenworth, Kans.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	73.0	70.0	59.0	41.5	(¹)	.....
Westmoreland, Kans.	(¹)	(¹)	(¹)	47.0	62.0	72.4	74.7	71.0	68.0	(¹)	(¹)	(¹)	.....
West Union, Iowa	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	30.0	13.8	.....
White Plains, N. Y.	24.9	38.8	36.8	47.7	58.6	69.3	70.6	72.5	67.9	55.2	43.1	34.3	51.6
Wilkesbarre, Pa.	21.6	32.3	33.8	45.9	58.2	70.0	67.2	68.7	(¹)	51.6	38.4	30.8	.....
Williamstown, Mass.	18.3	27.8	29.2	42.1	54.5	67.1	69.1	65.9	60.9	49.4	36.0	27.9	45.7
Wilton Centre, Ill.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	70.3	69.9	66.1	54.9	35.5	25.7	.....
Woodstock, Md.	27.6	39.3	39.9	52.9	65.0	71.0	72.3	72.0	70.0	55.5	41.8	33.7	53.4
Woodstock, Vt.	11.1	24.4	26.7	42.0	54.2	66.2	66.0	66.9	(¹)	45.9	32.7	21.8	.....
Worcester, Mass.	20.4	28.3	26.6	(¹)	64.9	64.2	68.5	62.1	48.7	37.6	28.9	.....	.....
Wauwatosa, Wis.	(¹)	(¹)	39.5	50.8	60.5	72.5	80.0	70.5	68.8	57.5	40.0	31.6	.....
Wytheville, Va.	29.2	43.1	45.2	49.6	62.7	65.9	69.9	68.0	65.5	58.4	42.7	38.3	53.2
Yates Centre, Kans.	19.5	27.7	41.8	45.6	61.8	70.6	78.7	73.5	73.9	68.8	39.5	22.8	51.2
Yutan, Nebr.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	75.4	70.4	68.1	55.8	36.5	14.3	.....

¹ No record.

APPENDIX 17.

Monthly maximum and minimum temperatures and annual range of temperature (in degrees Army, for the year end-

[From self register

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Accotink, Va.	52	0	73	12	69	10	80	33	92	50	96	54
Albany, S. C.	69	8	76	18	80	23	89	38	90	54	(1)	(1)
Albany, Oreg.	59	24	66	8	60	81	80	40	88	46	88	52
Allison, Kans.	62	-17	60	-20	77	Zero.	84	27	92	32	95.5	54
Altoona, Pa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Amherst, Mass.	40	-8	46	5	54	Zero.	70.3	31.2	85.2	37.6	92.5	52.2
Andersonville, Ga.	70	12	81	28	81	26	91.8	46.4	93	65	(1)	(1)
Anna, Ill.	65	-21	68	6	72	15	83	31	88	47	92	55
Ann Arbor, Mich.	51	-16.6	(1)	(1)	(1)	(1)	68.5	30	(1)	(1)	(1)	(1)
Archer, Fla.	79	21	86	36	93	36	90	44	96	61	90	63
Ardania (Phillips'n), N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88	30	93.5	47
Ashwood, Tenn.	66	8	70	1	76	25	82	34	88	52	94	58
Atchison, Kans.	63	-6	(1)	(1)	70	8	77	30	86	41	90	55
Athens, Ga.	(1)	(1)	(1)	(1)	(1)	(1)	87	33	89.5	50	90	52
Auburn, N. Y.	47	-14	50	-4	56	2	72	30.5	86	37	87	54
Austin, Tenn.	64	12	68	4	73	22	82	32	86	42	(1)	(1)
Austin, Tex.	76	20	(1)	(1)	84	32	87	41.5	92	49	96	64
Bainbridge Isl'd, Wash.	54	25	56	7	66	22	78	38	84	38	80	42
Bandon, Oreg.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	68	45
Beloit, Wis.	39	-27	38	-10	65	9	79	28	79	32.5	86	43.5
Belvidere, N. J.	(1)	(1)	(1)	(1)	(1)	(1)	68	35	(1)	(1)	(1)	(1)
Bethel, Conn.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88	26	(1)	(1)
Birmingham, Ala.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Blacksburg, Va.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Bloomington, Pa.	46	-6	55	-4	60	3	76	28	88	42	88	50
Blue Lake, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80	43
Bowling Green, Ky.	63	-8	69	8	74	6	(1)	(1)	(1)	(1)	(1)	(1)
Boyne, Mich.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Brevard, N. C.	60	3	71	11	74	11	84	28	88	40	94	44
Bunker Hill, Ill.	63	-27	62	-1	72	5	84	31	86	38	95.1	50.3
Burlington, Vt.	46	-14	49	-19	56	-5.3	72.3	24.5	81.8	35.5	88.5	42.4
Carson City, Nev.	56	-5.5	52	-18	60	21	71	27	82	32	89.5	36.5
Carthage, Mo.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Catawissa, Pa.	48	-5	62	Zero.	65	Zero.	76.5	31.5	89.5	35.5	89.5	43.5
Cedar Rapids, (W.) Iowa	39	-34	44	-14	67	-10	80	23	80	33	88	43
Cedar Rapids, Iowa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Chambersburg, Pa.	45	-4	52	4	65	8	76	32	91	38	90	56
Chapel Hill, N. C.	61	Zero.	76	16	80	16	88	35	94	48	98.5	41
Charlotte, Vt.	39	-16	48	3	52	-12	78	26	82	38	91	48
Chester, Minn.	39	-38	40	-24	63	-18	70	21	81	35	89	51
Cincinnati (G. W. H.) Ohio	57	-20	70	2	76	9	83	33	93	46	98	60
Clarksville, Texas	71	3	75	10	79	30	84	34	88	50	93	56
Clay Centre, Kans.	60	-17	63	9	(1)	(1)	(1)	(1)	(1)	(1)	95	55
Cleburne, Tex.	72	1	78	16	84	28	90	32	92	46	96	58
Cleveland, Ohio.	50	-8.5	62	1	63	3	74	26.5	80	36	86	51
Clinton, Ind.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	84	38	94	50
College City, Cal.	67	-28	76	26	78	36	82	47	94	58	96	55
College Hill, Ohio.	54	-19	60	2	70	4	(1)	32	90	40	96	61
Collinsville, Ill.	64	-23	61	2	70	8	81.5	32	85	48	93	52
Conception, Mo.	47	-31.5	53	-9.7	68	0.5	73	25	80	35	85.1	67
Contoocook, N. H.	(1)	(1)	(1)	(1)	56	-11	(1)	(1)	85	39	92	41
Cooperstown, N. Y.	45	-10	46	-1	49	Zero.	68	27	84	34	85	54
Cornish, Me.	38	-11	47	8	55	-4	(1)	(1)	83	38	92	46
Cresco, Iowa.	38	-33	36	-18	66	-10	78	20	78	35	87	53
Crete, Nebr.	45	-25.3	57	-16	73	-4.6	80.6	24.5	87.8	32.2	91	44.8
Cumberland, Md.	54	2	62	8	65	9	76	20	85	40	85	50
Dale Enterprise, Va.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Des Moines, Iowa.	50	-31.3	51	-8	72	-4	77	23	80	41	86	54
Dillingersville, Pa.	46	-24	53	-14	69	-4	75	25	84	32	94	50
Distributing Reservoir, D. C.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	87	40	95	50
Dorset, Vt.	48	5	71	12	65	14	78	34	90	45	93	55
Drifton, Pa.	47	-19.5	57	-1	58	-9	70.8	12	82.5	29.8	87	38.5
Drifton, Pa.	(1)	(1)	56	-8	65	-8	73	24	88	32	92	41

¹ No record

Monthly maximum and minimum temperatures and annual range of temperature (in degrees

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Dudley, Mass.	47	3	(1)	(1)	(1)	(1)	(1)	(1)	86	43	(1)	(1)
Dyberry, Pa.	45	-16	45	-4	58	-6	71	21	90	27	91	36
Easton, Pa.	43	1	56	6	64	5	(1)	(1)	92	47	95	54
East Portland, Oreg.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	86	42	88	50
Elk Falls, Kans.	38	2	38	4	50	26	56	32	(1)	(1)	68	51
Embarraas, Wis.	46	-35	40	-20	62	-15	75	26	94	43	90	49
Emmittsburg, Md.	(1)	(1)	(1)	(1)	69	9	79	31	86	46	89	54
Emporia, Kans.	(1)	(1)	60	-4	(1)	(1)	80	28	84	38	92	52
Eola, Oreg.	87	16	60	3	62	25	75	41	86	48	82	52
Factoryville, N. Y.	47	-21	50	1	57	Zero.	72	25	87	30	88	40
Fall Brook, Cal.	76	38	35	39	75	38	(1)	(1)	(1)	(1)	(1)	(1)
Fall River, Mass.	48	1	53	4	62	3	65	26	78	33	90	40
Fallsington, Pa.	47	3	64	8	63	8	72	33	87	46	93	53
Fallston, Md.	47	4	65	9	60	8	71	30	85	40	92	49
Fayetteville, Ark.	67	-19	67	5	78	14	78	32	85	40	90	46
Flat Rock, N. C.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Forayth, Ga.	72	6	78	20	80	26	(1)	(1)	92	50	92	63
Fort Collins, Colo.	52	-11	(1)	(1)	58	12	71	12	78	31	(1)	(1)
Fort Madison, Iowa	40	-90	44	2	67	1	83	28	83	44	91	56
Fort Scott, Kans.	64	-24	64	1	78	17	80	31	96	42	95	58
Fort Wayne, Ind.	52	-18	57	-7	70	3	80	30	82	40	95	55
Frankfort, Ky.	58	-19.8	69	4	(1)	(1)	83	25	86.2	42.6	92.2	52.3
Franklin, Pa.	42	-23	59	-12	60	-10	(1)	(1)	80	34	90	53
Freemont, Nebr.	47	-26	53	-23	70	-9	79	24	87	29	96	47
Gardiner, Mo.	44	-19	44	Zero.	48	-19	63	24	75	32	84	37
Garrettsville, Ohio	(1)	(1)	63	-6	62	-10	76	27	82	30	92	40
Genoa, Nebr.	42	-28	56	-22	69	-11	77	22	86	39	95	45
Germanstown, Pa.	40	-6	56	5	55	5	(1)	(1)	84	41	92	50
Gramplan Hills, Pa.	42	-16	54	-8	56	-4	72	22	88	29	96	46
Grand Coteau, La.	76	20	78	28	80	38	81.9	39.8	85.2	58.1	96.2	65.5
Grand Junction, Colo.	(1)	(1)	(1)	(1)	(1)	(1)	76	33	(1)	(1)	(1)	(1)
Great Falls Reserv'r, Md.	(1)	(1)	(1)	(1)	61	10	77	32	89	45	90	52
Green Springs, Ala.	67	4	76	20	80	32	82	40	87	50	93	58
Guttenberg, Iowa	42	-38	38	-18	68	-12	86	26	84	34	90	50
Hartford, Conn.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	90	32.5	97	49.2
Haverford College, Pa.	40	7	60	6	59	6	68	32	85	36.5	88	41
Heath, Mass.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	80	32	92	56
Holvetia, W. Va.	58	-7	68	-2	68	-8	78	25	88	36	96	40
Highlands, N. C.	50	-8	64	-4	69	10	76	22	80	44	80	52
Hilldale, Mich.	49	-30	54	-7	60	-9	76	22	80	30	95	47
Hiram, Ohio	(1)	(1)	60	-12	61	Zero.	67	29	(1)	(1)	80	56
Holton, Kans.	54	-24	59	-8	75	7	(1)	(1)	(1)	(1)	(1)	(1)
Hudson, Mich.	47	-30	55	-8	(1)	(1)	(1)	(1)	88	28	91	47
Hulmeville, Pa.	45	-8	62	8	(1)	(1)	(1)	(1)	85	38	96	50
Humboldt, Iowa	41	-33	44	-23	65	-10	70	27	80	36	86	36
Humphrey, N. Y.	37	-9	54	-15	49	-4	70	24	84	33	88	50
Hydeville, Cal.	65	30	78	24	68	34	78	40	80	46	76	50
Independence, Iowa.	39	-29	40	-10	63	-10	74	27	78	40	82	56
Independence, Kans.	62	-20	64	-1	75	16	78	28	91	35	90	49
Indianola, Iowa	47	-28	51	-8	69	-4	70.4	30	77	40	88	60
Ionia, Mich.	45	-24	50	-18	60	-8	78	26	78.5	31.5	89	44
Ithaca, N. Y.	46	-15	55	-4	56	-8.5	73	24	80	32	92.5	44
Jacksonburg, Ohio.	40	-28	64	4	68	Zero.	89	26	89	38	101	54
Jeffersonville, Ind.	(1)	(1)	70	11	74	10	82	32	88	43	90	54
Johnsontown, Va.	61	4	76	19	72	19	79	37	(1)	(1)	91	58
Kalamazoo, Mich.	42	-10	49	-1	62	6	(1)	(1)	81	39	90	51
Keller's (near Raleigh) N. C.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Kenewick, Wash.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Kiantone, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Klamath Agency, Oreg.	(1)	(1)	(1)	(1)	(1)	(1)	78	21	(1)	(1)	95	37
Laconia, Ind.	60	-23	70	-8	72	-6	83	31	87	44	95	61
Lafayette, Ind.	55	-28	60	-4	70	-5	79	28	80	36	90	50
Lancaster, Wis.	(1)	(1)	(1)	(1)	67	-17	(1)	(1)	78	31	86	41
Lausling, Mich.	47	-13	56	-13	64	-9	76	25	82	34	89	47
Lawrence, Kans.	57	-21.5	57	-1	73	12	76.5	28.5	85	36	92	48
Lead Hill, Ark.	69	-15	73	Zero.	79	17	87	28	93	46	100	51
Leetadale, Pa.	52	-12	65	Zero.	66	1	77.2	22	86.5	31.8	90	47.9
Lenoir, N. C.	54	3	66	11	70	12	(1)	(1)	74	(1)	86	45
Le Roy, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Liberty Hill, La.	71	13	71	22	77	48	79	53	83	68	94	72
Limona, Fla.	82	23	86	40	91	38	95	47	96	62	100	63
Lincolnton, N. C.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	86	61
Logan, Iowa	48	-28	56	-10	70	-4	(1)	(1)	84	41	94	56
Lonsport, Ind.	60	-24	60	-5	72	-4	82	26	84	40	92	58
Luling, La.	78	18	(1)	(1)	(1)	(1)	75	41	(1)	(1)	99	64
Lunenburg, Va.	46	-23	45	-4	50	-12	68	20	78	35	86	49

¹ No record.

REPORT OF THE CHIEF SIGNAL OFFICER.

Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Conti

July.		August.		September.		October.		November.		December.	
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
88	55	80	63	93	42	80	25	(1)	(1)	(1)	(1)
89	49	90	34	90	31	76	22	58	17	56	-15
90	61	98	62	98	46	88	36	62	30	70	4
91	52	94	50	70	42	68	38	(1)	(1)	54	8
92	56	(1)	52	72	50	65	44	51	15	(1)	(1)
93	56	86	52	85	46	86	25	62	-10	46	-30
94	(1)	(1)	(1)	86	51	86	31	65	24	90	-4
95	54	93	51	94	50	87	34	69	9	61	-10
96	54	92	56	68	40	68	37	59	30	49	8
97	45	93	36	92	38	80	22	58	14	58	-12
98	(1)	(1)	(1)	(1)	(1)	92	40	90	40	78	34
99	53	83	47	89	45	79	27	63	22	58	-10
100	62	93	56	92	48	81	31	62	20	62	Zero.
101	54	91	52	93	45	88	29	67	22	61	Zero.
102	50	88	50	92	53	85	32	(1)	(1)	(1)	(1)
103	(1)	82	56	83	41.5	84	30	65	22	(1)	(1)
104	72	96	68	96	62	100	38	78	30	73	16
105	61	(1)	(1)	(1)	(1)	84	15	67	15	67	-11
106	62	93	59	91	49	85	27	60	10	50	-12
107	64	95	60	94	54	90	32	(1)	(1)	47	-2
108	53	96	52	98	44	93	30	68	10	58	-18
109	(1)	90	49	90	50	89	27	(1)	(1)	65	-6
110	46	88	46	88	33	90	20	61	12	53	-12
111	50	(1)	(1)	94	44	83	25	58	1	55	-34
112	48	83	45	83	34	74	28	57	16	59	-13
113	45	91	47	96	37	86	29	68	14	63	-8
114	52	91	49	89	44	86	24	67	-1	62	-24
115	57	92	56	92	48	80	31	(1)	(1)	58	0.2
116	54	94	50	94	38	80	22	60	10	58	-12
117	68	96	67	93	62	89	46	78	34	75	25
118	(1)	104	52	95	38	(1)	(1)	(1)	(1)	(1)	(1)
119	56	92	58	96	46	90	26	70	24	68	11
120	70	96	64	93	57	93	34	74	29	73	12
121	54	96	48	94	40	88	23	62	-8	44	-24
122	54	96	42	94	33	81	24	64	18	59	-12
123	59	98	59	90	42	82	30	62	18	63	-1
124	52	(1)	(1)	92	34	74	23	(1)	(1)	50	(1)
125	42	90	48	92	40	88	26	67	20	65	-6
126	55	82	52	78	40	83	18	62	7	55	9
127	47	93	39	93	38	88	23	60	19	54	-19
128	59	90	55	91	49	82	29	60	10.5	69	-4.5
129	(1)	(1)	(1)	(1)	(1)	90	26	73	10	62	-10
130	47	96	40	95	32	86	21	61	5	53	-28
131	60	95	48	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
132	50	88	48	89	44	84	16	61	-2	48	-29
133	56	90	48	87	39	79	24	58	10	58	-13
134	50	80	30	76	42	76	40	70	40	(1)	(1)
135	58	84	56	84	48	78	26	54	Zero.	43	-22
136	55	96	53	94	53	91	32	73	16	64	-8
137	60	88	55	88	47	84	26	65	4	53	-16
138	44	92	39	92	35	83	25	59	8	51.5	-23.5
139	48	91	39	90	34	83	22	60	15	58	-20
140	54	99	44	(1)	(1)	95	28	62	10	58	-8
141	58	92	53	90	50	88	28	67	17	62	-7.5
142	69	91	67	92	59	94	37	78	29	70	12
143	51	92	47	95	49	81	32	60	13	49	-9
144	(1)	92	66	87	59	91	30	77	26	74	8
145	(1)	(1)	(1)	(1)	(1)	(1)	(1)	56	24	43	-26
146	85	96	52	(1)	(1)	75	28	(1)	(1)	(1)	(1)
147	58	93	30	(1)	(1)	(1)	(1)	(1)	(1)	52	-13.1
148	60	89	51	43	50	89	27	67	16	63	-9
149	(1)	89	54	91	36	86	25	65	7	58	-31
150	50	89	40	(1)	(1)	84	17	61	-9	45	-30
151	50	93	55	93	43	85	27	63	9	55	-22
152	(1)	(1)	52	92	48	85	31	70	10	59.5	-6.5
153	62	100	46	102	51	97	81	86	16	67	4
154	43	92	61	89	45	80	30	68	23	64	10
155	56	94	41	95	34	84	21	68	16	63	-8
156	46	95	33	92	32	87	40	74	31	70	29
157	72	96	71	94	69	93	52	85	41	84	34
158	77	77	70	85	53	83	42	(1)	36.3	(1)	33
159	88	88	50	93	44	86	22	64	Zero.	54	-24
160	98	98	51	96	43	90	30	70	10	62	-15
161	52	96	63	93	59	90	48	78	33	81	25
162	59	87	40	84	35	70	25	50	10	50	-26

¹ No record.

Monthly maximum and minimum temperatures and annual range of temperature (in degrees

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Madison, Nebr.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Madison, Wis.	42	-27.2	37	-18	61	-9.8	76	25	78	36	85	47
Manatee, Fla.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Manchester, Iowa.	(1)	(1)	48	-14	68	-9	80	31	83	38	90	47
Manhattan, (B), Kans.	(1)	(1)	56	-9	80	10	88	27	88	37	(1)	(1)
Manhattan, Kans.	60	-23	68	-6	(1)	(1)	(1)	(1)	(1)	(1)	101	54
Manistiquie, Mich.	43	-21	37	-26	62	-26	65	17	79	29.5	83	39
Manitowoc, Wis.	42	-22	43	-14	58	-10	64	26	80	39	86	40
Margaretta Township, Ohio	50	-16	46	6	57	5	72	31	69	48	86.2	56.2
Marion, Va.	60	-8	68	Zero.	72	8	79	27	82	41	90	52
Marquette, Nebr.	42	-22	50	-3	66	10	78	32	81	41	89	67
Marshall, Mich.	47	-12	43	-8	59	8	80	30	81	42	92	53
Mattoon, Ill.	63	-28	62	2	70	3	83	30	85	42	94	53
Maud, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	79	22	(1)	(1)	(1)	(1)
Maynard, Iowa.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	68	34	89	48	48
Mayport, Fla.	75	27	82	41	86	43	86	55	89	60	90	70
Mazatlan, Mex.	79	58	80.8	55.5	(1)	(1)	81.3	54	86	61.3	93	68
McDonogh, Md.	(1)	(1)	68	7	62	3	72	33	84	41	87	49
Menard Station (near Albany), N. Y.	46	-10	48	5	53	4	72	32	84	30	90.5	55.5
Mendon, Mass.	42	-4	53	0.2	58	3	64	28	83	40	88	51
Mendon, Mich.	48	-21.5	(1)	(1)	(1)	(1)	(1)	82	41	97	46	46
Milan, Tenn.	67	-10	72	13	76	24	84	31	87	46	92	56
Milledgeville, Ga.	(1)	(1)	(1)	(1)	79	21	(1)	88	50	88	52	42
Milton, Mass.	46	-4	56	1	59	1.5	68	26	85	36	90	44
Minneapolis, Minn.	38	-33	39	-18	58	-16	72	31	82	35	87	48
Monticello, Iowa.	42	-33	44	-12	68	-8	80	18	83	34	98	44
Moorestown, N. J.	46	0.5	66	8	63	8	74	33	90	41	94	45
Mottville, Mich.	49	-24	55	-7	60	-5	81	28	78.2	34	89	50
Mountainville, N. Y.	49	-15	56	-1	61	-3	73	22	(1)	(1)	97	37
Mount Forest, Canada.	40	-23	41	-11	49	-23	68	18	77.5	31	87	48
Mount Ida, Ark.	72	-2	76	10	78	20	84	27	84	48	94	50
Mount Vernon, Iowa.	45	-35	46	-8	65	-8	84	25	88	41	94	53
Muscataine, Iowa.	45	-28	45	-4	66	-3	82	25	81	36	89	45
Nayatt Point, R. I.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Nellisville, Wis.	36	-36	35	-25	55	-34	69	18	75	29	80	36
Nephi, Utah	47	-12	49	-16	52	18	68	25	80	30	91	40
New Athens, Ohio	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
New Bedford, Mass.	46	-1	65	5	(1)	(1)	(1)	(1)	74	41	87	49
Newport, Fla.	69	18	76	32	80	36	83	45	(1)	(1)	(1)	(1)
Newport, Vt.	48	-29	43	-4	54	-24	72	24	80	38	92	44
New Tacoma, Wash.	55	-25	(1)	(1)	61	23	(1)	(1)	(1)	(1)	76	52
New Ulm, Tex.	78	12	70	22	84	33	86.5	40	79	61.5	95	62
North Colebrook, Conn.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Northfield, Minn.	41	-29	34	-19	62	-12	71	18	80	31	89	43
North Lewisburg, Ohio.	49	-23.5	59	-4	65	-2	78	27	84	34	94.5	50
Northport, Mich.	37	-4	43	-2	50	-8	70	28	76	37	86	52
North Volney, N. Y.	41	-6	45	3	53	2	74	26	(1)	(1)	89	52
Oakland, Cal.	60	31	73	28	67	38	70	43	81	48	78	54
Ogreets, N. C.	50	-2	61	11	70	19	66	40	72	57	77	66
Orono, Me.	43	-29	44	-8.4	50	-14	65.9	23.8	75.5	34.1	88.6	38.2
Oskaloosa, Iowa.	34	-29	(1)	(1)	65	-4	(1)	80	38	89	55	55
Ottumwa, Iowa.	49	-3.5	(1)	(1)	71	-2	79.6	27.4	83	38	90	54.5
Palermo, N. Y.	40	-10	43	Zero.	49	Zero.	71	25	85	33	89	54
Paramaribo (Dutch Guiana), S. A.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	88.6	69	89	70	70
Paterson, N. J.	49	Zero.	52	5	60	6	72	33	87	40	(1)	(1)
Peoria, Ill.	48	-27	49	5	67	Zero.	85	31	84	44	94	50
Phillipsburg, N. J.	42	-10	58	2	64	4	(1)	(1)	(1)	(1)	92	54
Pierce City, Mo.	63	-9	70	-6	73	18	80	28	89	35	92	48
Pleasant Grove, Wash.	(1)	(1)	(1)	(1)	68	3	75	29	85	32	89	36
Point Pleasant, La.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Port Jervis, N. Y.	38	-3	50	2	57	1	(1)	87	39	92	52	52
Portsmouth, Ohio.	58	-16	68	5	59	8	84.5	32	90	41	93	53.5
Poway, Cal.	76	31	(1)	(1)	71	40	74	43	79	52	97	56
Prairie du Chien, Wis.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	83	42	89	58	58
Princeton, Cal.	65	-28	75	22	74	37	75	38	89	46	92	53
Princeton, Mass.	40	-6.5	52	2	50	3	68	20	81.5	27	89.7	41
Providence, R. I.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	87.5	32	95	40	40
Pueblo, Colo.	60	-11	66	-13	70	16	74	30	82	38	90	54
Puerto de Luna, N. Mex.	(1)	(1)	(1)	(1)	81	19	(1)	90	43	101	61	61
Quakertown, Pa.	42	-2	52	2	59	-2	68	28	81	37	88	41
Quitman, Ga.	70	17	(1)	(1)	82	41	(1)	(1)	(1)	(1)	(1)	(1)
Raleigh, N. C.	63	2	(1)	(1)	(1)	(1)	(1)	85	50	(1)	(1)	(1)
Readington, N. J.	44	Zero.	54	16	62	6	76	36	90	46	100	52
Receiving Reservoir, D. C.	51	4	72	10	67	12	88	33	92	44	94	52

(1) No record.

Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
o	o	o	o	o	o	o	o	o	o	o	o	o
(¹)	(¹)	(¹)	(¹)	87	42	(¹)	(¹)	72	2	64	-22	.....
85	82	84.9	49.4	86	47	80	26	00	-5	43	-20	113.2
(¹)	(¹)	92	65	92	72	84	61	86	50	86	43	.....
96	54	90	46	94	45	85	24	62	-4	50	-31	.....
103	57	100	54	102	52	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	.....
108	57	100	54	102	52	90	30	(¹)	(¹)	(¹)	(¹)	.....
83	41	84	35	88	35	81	19	62	-1	48	-19	114
85	46	84	45	85	42	84	24	(¹)	(¹)	47	-21	.....
80	64	92	51	90	46	83	31	49	17	61	-15	108
88	50	88	56	89	43	88	24	66	20	66	-2	98
82	71	90	68	88	58	83	35	00	-14	57	-14	114
87	60	93	43	94	43	84	32	(¹)	(¹)	(¹)	(¹)	.....
97	59	98	50	99	54	98	30	73	11	64	-13	127
(¹)	(¹)	94	58	96	50	88	(¹)	73	9	60	-12	.....
88	50	87	48	90	84	81	16	58	-14	46	-30	.....
95	76	91	72	90	72	87	61	77	48	80	40	68
92.2	96	94	66	94	65	90	60	86	61	82	55	.....
89	(¹)	87	58	89	44	87	28	67	20	62	-1	.....
88	57	91.7	50	88	46	76	31	59	20.5	53	-20	111.7
86	56	87	55	87	44	78	29	64	8	57	-10	98
97	45	93	41	98	44	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	.....
95	64	99	54	97	50	93	27	75	31	65	5	109
94	64	92	61	89	51	94	35	78	26	71	18	.....
85	54	85	50	88	40	78	32	63	19	68	-12	102
(¹)	(¹)	90	51	87	47	90	18	59	-13	46	-32	.....
92	50	90	45	90	30	85	17	62	-2	48	-24	126
92	62	93	46	94	47	83	30	64	17	64	-3	96
87	56	90	45	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	.....
94	53	95	42	94	35	84	20.5	63	17	62	-14	.....
84	46	90	43	88	31	76	26	54	11	44.5	-18	113
100	60	103	52	95	62	89	32	76	18	70	15	105
89	63	(¹)	(¹)	(¹)	(¹)	87	23	67	Zero.	48	-24	.....
80.7	53	92	43.5	94	41	87	24	68	5	54	-19	122
(¹)	(¹)	(¹)	(¹)	96	44	85	32	62	26	66	-10	.....
82	30	89	37	90	29	74	18	43	-22	87	-38	128
92	47	92	40	85	28	77	23	63	16	50	-7	108
(¹)	(¹)	91	49	90	38	83	25	64	16	59	-9	.....
81	56	81	52	87	43	78	29	56.5	22	55	-10	.....
(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	78.6	34	74.4	27	.....
91	48	92	42	90	30	76	28	54	0	50	-23	121
76	51	89	52	69	42	(¹)	(¹)	61	29	51	7	.....
100	72	86	79	83.9	74	90	50	80	30	(¹)	(¹)	.....
(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	58	11	57	-20	.....
88	44	87	50	90	41	82	18	60	-12	45	-38	128
90	52	92	48	96	37	87	25	64	11	56	-20	119.5
86	50	92	54	90	54	80	30	56	10	48	2	96
85	54	97	49	95	36	80	24	56	17	57	-15	.....
88	55	78	54	76	47	75	41	70	42	68	80	60
79	61	80	62	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	.....
84.1	49.1	89	44	88	30	78	23	58	9	50	-30	118
(¹)	(¹)	86	55	87	44	85	23	65	9	52	-20	.....
94	60	92	57	95	42	91.8	27	70.1	6	56	-18	.....
87	50	90	46	92	34	79	23	57	15	58	-19	111
89	60	91	70	92	70	95	70	94	69.5	92	60	.....
90	60	(¹)	(¹)	93	49	(¹)	(¹)	(¹)	(¹)	56	-2	.....
98	39	97	50	94	50	90	29	68	16	57	-10	124
92	59	92	49	90	49	78	31	60	22	64	-3	.....
100	56	91	52	95	58	(¹)	(¹)	(¹)	(¹)	68	-1	.....
91	43	95	37	75	22	70	17	56	15	46	-25	.....
(¹)	(¹)	97	66	96	61	92	39	76	32	71	17	.....
90	56	90	48	88	42	82	30	56	16	56	-7	.....
94	48	93	51	92	44	89	26	70	20	53.5	-5.5	110
101	59	104	59	90	53	87	41	87	80	78	80	.....
87	54	90	51	90	46	86	23	62	-8.9	46.8	-24.1	.....
98	56	104	56	87	45	84	44	78	82	68	24	82
85.5	48.5	90	43	89	40	78	23	54	14	54	-18	108
(¹)	(¹)	(¹)	(¹)	92	39	81	28	67	18.9	62.2	-11.5	.....
96	62	91	54	89	44	80	23	67	16	60	-15	111
106	72	99	68	(¹)	(¹)	(¹)	(¹)	67	21	(¹)	(¹)	.....
86	52	88	45	(¹)	(¹)	(¹)	(¹)	60	17	52	Zero.	.....
(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	85	44	80	85	74	28	.....
(¹)	(¹)	92	67	92	58	93	42	(¹)	(¹)	71	12	.....
94	62	100	56	104	50	90	33	74	24	66	-3	106
96	62	94	59	98	46	92	30	71	27	67	14	94

(1) No record.

Monthly maximum and minimum temperatures and annual range of temperature (in degrees

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Red Willow, Nebr.	6	0	0	0	0	0	0	0	0	0	0	0
Richardson, Dak.	49	-15	63	-14	77	Zero.	53	26	86	22	104	47
Richmond, Ky.	38	-34	(1)	(1)	64	-17	71	13	76	30	88	51
Riley, Ill.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	84	47	87.8	59
Ripon, Wis.	40	-31	38	-10.5	64	-10	77.3	25.5	78.5	32.6	87.1	45.8
Rock Creek Bridge, D. C.	42	-40	36	-15.5	64	14	78	27	78	32	86	43
Rockford, Ill.	49	6	74	11	70	16	83	33	97	50	96	60
Round Grove, Iowa.	41	-28	39	-9	64	8	79	29	78	42	87	51
Rowe, Mass.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Rugles, Ohio	46	-15	48	-2	54	3	64	26	84	29	87	46
Sacramento, Cal.	45	-20	58	4	66	Zero.	80	24	88	36	91	54
Salina, N. J.	62	27	74	25	72	36	80	38	87	48	92	53
Salina, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	89	50	96	42
Salina City, Cal.	52	4	48	3	65	11	68	35.8	70	46	84.5	63
Sandwich, Ill.	65	30	76	25	72	84	72.5	44.5	80.5	50	72	54
San Rafael, Cal.	62	-6	(1)	(1)	66	-7	(1)	(1)	82	44	93	54
Sherlock, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	74	56	86	40	(1)	43
Snowville, Va.	(1)	(1)	(1)	(1)	76	11	83.6	31.1	88.6	33	96.5	56
Somerset, Mass.	59	Zero.	68	4	69	0	(1)	(1)	82	38	88	43
Somerville, N. J.	42	-7	53	2	60	2	76	26	89	32	96	42
Southampton, Conn.	43	-7.5	55	0.5	62	3	69.2	33.5	88.5	46.2	94	53.5
South Orange, N. J.	49	-9	48	-1	64	-0.9	70	14	91	26	95	46
Spiceland, Ind.	44	4	58	4	64	4	76	32	88	40	92	46
Springfield, Ark.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	84	35	95	54
Springfield, Mo.	61	-2	69	18	(1)	(1)	(1)	(1)	(1)	(1)	87	65
Stateburg, S. C.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	89	40	98	58
Stato College, Pa.	66	8	75	21	77	28	84	58	86	53	88	53
Statesville, N. C.	46	-5	54	-4	59	4	(1)	(1)	81	36	88	48
Sterling, Kans.	(1)	(1)	71	16	78	16	82	36	90	51	93	54
Stockham, Nebr.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Stratford, Vt.	50	6	58	2	68	16	74	38	82	48	94	74
Summit, Va.	42	-14	44	-2	46	-4	66	22	80	34	90	52
Sunman, Ind.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Sussex, Wis.	51	-24	62	6	70	Zero.	84	53	86	34	94	56
Swanwick, Ill.	39	-27	36	-16	62	-12	77	23	78	36	88	44
Swartz Creek, Mich.	64	-22	63	2	68	10	80	36	83	46	91	53
Sycamore, Ill.	49	-25	61	-16	57	-15	69	28	81	28	88	43
Syracuse, N. Y.	39	-28	36	-7	63	-7	77	28.8	78	43	89	32
Tallahassee, Fla.	(1)	(1)	51	2	55	2	(1)	(1)	86	40	94	58
Tamaqua, Pa.	74	13	(1)	(1)	84	40	82	52	91	62	86	65
Taunton, Mass.	(1)	(1)	(1)	(1)	(1)	(1)	76	28	90	46	100	56
Tecumseh, Nebr.	51	-3	54	3	65	4	71	26	85	31	95	34
Terre Haute, Ind.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	96	60
Thornville, Mich.	57	-21	63	-6	68	8	79	37	80	48	89	50
Topeka, Kans.	47	-19	54	-12	60	-12	71	26	83	34	92	50
Traverse City, Mich.	59	-22.5	68	-5	75	10	77	31	86	30	96	58
Troy, Pa.	39	-22	45	-19	54	-23	75	17	78	30	90	44
Variety Mills, Va.	49	-22	56	-5	61	-2	68	20	86	26	92.5	35
Vermillion, Dak.	50	-8.5	70	10	72	12	81.6	26.6	90.5	36.8	87.8	45.6
Vevay, Ind.	47	-34.5	53	-27	70	-10	78	22.5	84	29	81	(1)
Vineyard, N. J.	(1)	(1)	(1)	(1)	75	6	85	31	89	43	94	57
Volantown, Conn.	52	4	67	10	68	13	(1)	(1)	92	42	(1)	(1)
Wabash, Ind.	50	-4	55	Zero.	64	-2	(1)	(1)	83	33	94	54
Wausau, Wis.	54	-20	56	Zero.	67	1	76	32	81	40	91	56
Wauseon, Ohio	41	-32	36	-26	58	-25	70.5	20	79.5	30.5	89	39
Webster, Dak.	50	-31.7	58	-8.1	65	-7.5	78.6	21.5	82	29	82	48
Weldon, N. C.	39	-39	37	-33	54	-31	68	17	87	26	102	54
Wellington, Kans.	61	Zero.	74	19	77	16	82	36	93	50	94	53
Wellsborough, Pa.	58	-13	64	-5	77	13	91	27	87	38	95	53
Westborough, Mass.	42	-24	48	-10	(1)	(1)	72	26	84	40	95	50
West Chester, Pa.	46	-8	60	5	60	-3	65	28	93	37	100	35
Westerville, Ohio.	48	3	60	5	60	-4	71.5	31	86	38	90.5	45
West Leavenworth, Kans.	(1)	(1)	(1)	(1)	65	-4	79	27	86	33	91	49
Westmoreland, Kans.	55	-28	60	1	74	12	78	30	86	40	(1)	(1)
West Union, Iowa	(1)	(1)	(1)	(1)	(1)	(1)	80	21	85	34	96	46
White Plains, N. Y.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Wilkesbarre, Pa.	41	-1	48	-2	60	3	70	28	82	28	85	51
Williamstown, Mass.	50	-9	59	-1	60.9	-2.5	78.1	26	91	32	91	40
Wilton Centre, Ill.	39	-6.8	49	4	49.9	-2.1	67.5	27.7	80.7	31	85.6	40.5
Woodstock, Md.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Woodstock, Vt.	48	-2	68	5	65	5	80	27	81	38	91	41
Worcester, Mass.	45	-36	52	-5	54	-16	75	17	85	25	96	36.3
Wyandotte, Kans.	42	-1	56	1	52	2	(1)	(1)	80	38	86	47
Wytheville, Va.	(1)	(1)	(1)	(1)	70	9	78	28.6	81	40	90	55
Wytheville, Va.*	58	-2	72	2	69	11	81	26	83	37	85	43
Yates Centre, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Yutan, Nebr.	60	-22.5	62	-4	76	6	77	26.4	83	32.5	93.5	47.4
	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

* No record.

* Three and one-half miles from.

Fahrenheit) from reports made by voluntary observers of the Signal Service, &c.—Continued.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
o	o	o	o	o	o	o	o	o	o	o	o	o
100	50	96	47	96	34	88	20	76	8	69	-14	119
88	50	91	49	78	32	80	8	58	-19	41	-36	.....
93	62	90.7	56	90	57	88	30	64	17	66	-8.5	.....
87	50	88.8	47	90	45	81	24	63	-1.6	51	-21	121
89	50	85	47	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
99	64	98	62	96	49	92	32	74	28	70	8	93
87	58	87	51	89	45	83	26	65	-1	47	-19	117
(1)	(1)	(1)	(1)	92	50	86	28	63	Zero.	48	-24	.....
86	50	86	56	87	40	74	28	56	14	57	-19	106
92	53	93	48	93	44	84	83	60	12	58	-14	113
96	51	95	53	90	41	80	87	74	31	65	23	73
97	63	95	48	95	50	85	87	70	26	65	5	.....
87	72	94	65	86	62	79.2	41.2	54.8	14.5	44.8	-17	111
75	53	76	53	75	45	84	37	(1)	(1)	66	26	.....
91	60	94	51	96	50	84	29	65	Zero.	54	-20	.....
(1)	(1)	90	39	90	36	83	81	82	33	76	20	.....
100.4	68.8	90.4	55.7	91.4	48	83	35	86	12	70	-16	.....
87	47	86	55	86	49	84	26	61	20	70	-2	.....
94	46	91	41	94	39	86	24	64	18	58	-14	112
92	61	94	53	94	46	82	28	62	20	60	-7	101.5
94	54	92	54	93	32	80	28	62	17	51	-13	108
90	58	92	50	94	50	82	32	67	20	60	Zero.	94
93	47	92	46	93	46	89	24	63	9	59	-17	.....
87	70	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	.....
98	70	99	56	99	50	96	30	73	17	63	-5	.....
93	64	91	60	89	55	94	36	72	30	68	-17	110
68	50	90	44	(1)	(1)	80	23	64	12	58	-5	.....
93	61	91	61	92	55	91	34	69	26	72	10	.....
97.8	65	96	56	(1)	(1)	(1)	(1)	(1)	(1)	62	-10	.....
96	74	92	68	90	64	88	46	84	20	67	6	94
84	54	90	56	80	32	74	26	54	14	50	-24	114
98	50	98.5	65	98	42	93	26	74	18	68	4	.....
98	54	94	50	92	45	86	24	62	9	60	-6	122
99	51	89	46	89	45	82.5	24	55	-6	44	-25	117
94	67	93	55	94	53	(1)	(1)	(1)	(1)	60	-8	.....
86	45	90	37	91	36	83	23	58	10	54	-27	118
86	56	86.6	51	88	45	82	22	62	0.7	51	-19	117
93	56	92	58	99	42	(1)	(1)	(1)	(1)	(1)	(1)	.....
91	72	91	71	(1)	(1)	93.5	44	78	34	76	22	.....
94	60	96	58	98	53	85	32	60	20	56	-4	.....
86	50	93	50	97	37	86	26	65	18	63	-10	107
98	62	94	53	94	52	88	32	70	6	62	-14	.....
82	59	85	54	83	49	81	30	64	16	56	-9	110
90	48	93	46	92	43	84	27	60	12	53	-14	112
95	62	95	51	98	48	89	32	79	10	62	-6	120.5
91	43	93	41	91	41	81	26	58	8	47	-11	115
91	51	92	33	91	27	82	17	59	13	56	-15	114.5
95	50	92	54	94.9	38.7	91	25	72	19	67	-4	103.5
(1)	(1)	(1)	(1)	(1)	(1)	89	20	66	-5	60	-30	.....
90	54	93	51	92	47	90	27	70	16	66	-6	.....
95	59	91	56	92	43	89	26	67	16	64	-4	.....
89	58	94	50	82	40	84	28	64	18	62	-12	.....
91	56	90	53	87	52	83	31	64	10	56	-15	111
84	40	86	38	84	34	80	20	57	14	41	-30	121
92	43.9	94.3	38.9	95.3	30.5	88	18	63	4.7	56.3	-32.4	127.7
97	48	95	43	93	25	88	Zero.	75	-25	61	-36	141
97	64	92	62	35	52	95	33	76	24	70	8	97
105	57	97	51	100	47	92	31	74	14	60	-7	118
92	42	96	30	92	36	82	28	62	26	60	-12	.....
95	55	(1)	(1)	96	36	82	26	66	16	61	-12	.....
90.5	54	91	49	98	43	88	28	68	17	62	-1	94
89	47	92	43.5	91	36	86	23	64	12	59	-22	.....
100	59	94	52	91	49	86	32	71	12	59	-3	.....
96	51	95	48	94	46	(1)	(1)	(1)	(1)	(1)	(1)	.....
(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	62	-10	44	-25	.....
88	60	85	56	85	48	85	25	65	16	59	-6	94
90	49	94	38	(1)	(1)	82	23	64.1	18.5	49	-7	.....
84.2	54.2	86	46	83.4	38.4	73	25	51	21	58	-20	106
88	58	92	52	92	43	87	25	69	4	65	-24	.....
93	49	92	47	91	37	87	28	67	17	61	-8	101
93	42	96	38	(1)	(1)	74	25	56.6	10	52	-32	.....
82	51	87	45	86	42	76	27	62	18	56	-12	.....
97	63	93	48	91	46.5	86	29	67	13	60	-3	.....
87	46	86	42	86	38	86	25	67	20	67	Zero.	89
(1)	(1)	91	55	88	42	(1)	(1)	(1)	(1)	(1)	(1)	.....
100	54	100	47	100	51	89.4	31.4	65	12	64	-7	122.5
100	63	92	54	91	49	85	28	65	1	54	-21	.....

(1) No record.

APPENDIX 18.

Monthly and annual mean temperatures (in degrees Fahrenheit) at military post hospitals, for the year ending December 31, 1884.

[The daily mean is obtained by dividing the sum of the 7 a. m., 2 and twice the 9 p. m. (local time) observations by 4. The monthly by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Abraham Lincoln, Fort, Dak.	2.2	- 2.6	18.5	38.6	57.2	71.1	65.9	68.3	57.2	45.9	27.0	0	37.6
Alcatraz Island, Cal.	48.3	47.9	52.3	53.2	54.9	56.6	57.3	55.5	56.9	55.2	55.4	51.5	53.8
Angel Island, Cal.	52.4	51.6	52.3	56.3	60.3	61.4	63.6	60.9	60.5	58.0	57.2	52.2	57.3
Assinaboine, Fort, Mont.	13.2	4.2	23.1	42.5	59.0	67.9	(1)	67.3	51.7	47.1	36.6	2.8	.....
Barranca, Fort, Fla.	43.8	55.7	64.8	69.0	77.8	81.1	85.2	84.4	(1)	(1)	(1)	(1)	.....
Benicia Barracks, Cal.	47.6	48.1	53.4	55.9	61.7	63.1	63.2	63.3	64.3	60.4	56.5	50.2	58.1
Bidwell, Fort, Cal.	33.3	29.7	37.4	44.2	55.8	58.5	63.9	69.1	54.0	52.4	46.0	30.3	47.9
Brady, Fort, Mich.	8.0	8.7	18.5	36.8	49.3	64.0	59.3	62.0	57.7	46.6	30.6	18.0	28.8
Bridger, Fort, Wyo.	20.6	16.8	28.1	35.7	48.9	60.5	66.2	62.6	48.9	42.7	34.7	25.6	40.9
Brown, Fort, Tex.	(1)	(1)	(1)	(1)	(1)	(1)	85.6	84.1	82.0	74.9	66.4	60.7	.....
Buford, Fort, Dak.	5.6	- 2.0	19.6	39.3	(1)	71.1	66.4	70.2	52.7	45.5	28.6	0.9	.....
Columbus, Fort, N. Y. H.	25.8	34.5	37.4	(1)	53.8	69.0	70.8	71.9	70.2	56.4	43.3	33.8	.....
Concho, Fort, Tex.	39.0	49.5	54.8	62.6	68.7	73.3	87.1	82.1	80.8	67.1	55.5	42.7	64.3
David's Island, N. Y.	24.9	32.7	35.8	46.6	57.5	68.7	71.4	73.0	71.2	60.0	44.5	35.4	51.8
Ellis, Fort, Mont.	17.3	13.0	27.5	39.0	53.2	63.4	68.6	65.4	47.8	44.6	35.2	8.5	39.5
Fred Steele, Fort, Wyo.	(1)	(1)	39.9	35.5	50.0	65.2	69.6	65.5	55.4	45.3	31.8	19.1	.....
Gaston, Fort, Cal.	41.9	41.7	47.8	53.3	62.4	63.8	68.1	72.0	59.9	54.0	46.7	41.7	54.7
Hamilton, Fort, N. Y. H.	26.2	34.4	36.1	45.8	57.4	69.0	71.1	73.1	70.4	57.6	43.8	34.4	51.5
Keogh, Fort, Mont.	12.4	7.6	25.8	40.0	(1)	(1)	67.9	70.6	54.7	48.1	33.3	5.3	.....
Klamath, Fort, Oreg.	24.2	22.5	33.4	41.0	52.5	54.9	58.9	(1)	48.2	41.6	(1)	27.9	.....
Lewis, Fort, Colo.	22.3	23.2	28.7	35.0	48.4	58.6	62.5	60.2	52.9	46.3	35.1	25.6	41.6
Lyons, Fort, Colo.	24.2	26.6	40.8	49.0	56.9	71.3	79.1	73.8	69.5	57.2	40.1	20.4	51.0
Madison Barracks, N. Y.	13.9	23.6	27.6	40.2	52.8	65.4	65.1	67.8	64.3	49.9	36.1	24.9	44.3
Mason, Fort, Cal.	49.8	50.9	56.4	57.8	60.6	60.0	63.4	59.3	57.4	58.2	56.2	51.8	57.2
McDermitt, Fort, Nev.	23.8	22.0	32.5	39.5	46.1	57.8	63.3	70.6	51.4	46.3	41.2	29.1	44.0
McDowell, Fort, Ariz.	49.2	(1)	(1)	63.8	(1)	84.1	95.9	87.6	77.6	(1)	59.2	48.8	.....
McHenry, Fort, Md.	27.1	38.3	(1)	50.8	63.5	71.7	74.3	73.9	71.4	58.7	44.0	33.9	.....
Meade, Fort, Dak.	20.1	8.0	26.6	38.2	51.8	65.9	64.7	63.6	55.3	48.7	37.0	6.5	40.5
Mojave, Fort, Ariz.	51.7	52.5	(1)	67.3	77.0	85.5	93.4	92.2	81.8	73.3	65.6	51.9	.....
Monroe, Fort, Va.	35.2	47.0	47.0	52.1	66.3	72.2	75.9	75.5	74.0	64.9	51.5	42.9	58.7
Mount Vernon Barracks, Ala.	43.7	59.4	63.9	67.1	74.5	76.6	81.3	80.6	80.3	74.1	57.2	54.8	67.8
Niagara, Fort, N. Y.	19.3	26.4	30.1	40.0	51.6	64.7	66.4	68.5	66.1	52.6	37.4	29.9	46.0
Pembina, Fort, Dak.	- 8.6	- 10.1	8.3	(1)	49.3	(1)	(1)	(1)	(1)	(1)	23.6	- 0.8	.....
Plattsburg Barracks, N. Y.	9.7	22.0	26.9	41.8	53.9	67.1	66.8	69.2	63.2	47.6	34.5	22.6	43.8
Presidio, Cal.	48.2	48.5	52.9	54.2	57.8	58.7	58.8	57.7	57.3	55.2	55.4	.....	.....
Randall, Fort, Dak.	14.0	8.5	29.8	45.7	61.0	73.1	72.6	70.8	65.3	54.4	35.5	11.6	45.2
Reno, Fort, Ind. T.	30.5	35.5	(1)	56.8	65.3	74.6	81.9	76.4	78.1	60.8	47.5	27.9	.....
Robinson, Fort, Nebr.	23.0	18.0	(1)	41.6	57.2	71.6	73.6	69.9	62.8	53.6	37.5	.....	.....
Saint Augustine, Fla.	51.6	60.6	65.6	75.4	74.6	76.0	81.1	79.3	79.3	73.4	63.8	60.9	70.1
Shaw, Fort, Mont.	21.9	9.9	27.4	40.3	52.4	63.0	61.5	64.0	50.1	47.8	39.5	(1)	.....
Sisseton, Fort, Dak.	- 0.4	- 2.5	17.1	38.8	56.8	69.5	64.6	65.1	57.4	46.3	27.2	3.2	36.5
Sneeling, Fort, Minn.	3.7	8.0	24.1	44.0	58.6	65.5	63.2	68.0	62.9	49.5	26.1	8.9	41.0
Spokane, Fort, Wash.	22.4	16.1	34.8	49.6	60.1	68.2	69.3	72.7	52.5	46.6	(1)	(1)	.....
Sully, Fort, Dak.	11.6	5.5	37.2	44.0	59.7	73.7	70.9	71.2	64.2	52.9	34.2	8.7	43.6
Totten, Fort, Dak.	- 2.2	- 4.6	13.3	36.3	56.1	69.6	64.2	65.8	55.4	42.6	22.9	0.3	33.1
Townsend, Fort, Wash.	40.0	24.9	43.0	52.0	66.1	61.1	61.4	63.2	53.9	49.8	47.2	33.0	49.6
Union, Fort, N. Mex.	31.5	34.7	39.3	43.0	52.6	61.9	72.4	63.9	60.6	(1)	42.5	32.5	.....
West Point, N. Y.	(1)	(1)	(1)	46.3	58.3	70.2	70.5	(1)	67.9	(1)	41.0	31.9	.....
Wingate, Fort, N. Mex.	31.7	33.4	39.1	45.4	57.7	67.4	75.0	67.5	62.2	53.4	42.0	36.0	50.9
Yates, Fort, Dak.	5.9	1.4	21.1	40.8	58.7	72.4	67.5	68.2	59.0	47.7	29.2	5.2	32.8

(1) No record.

APPENDIX 19.

Monthly maximum and minimum temperatures (in degrees Fahrenheit) and annual range

[From self-regis]

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Abraham Lincoln, Fort, Dak.....	40	45	44	35	60	18	72	15	84	29	92	42
Alcatraz Island, Cal.....	58	39	70	29	66	41	65	44	73	47	75	49
Angel Island, Cal.....	71	38	77	28	82	48	77	33	93	49	88	52
Assinaboine, Fort, Mont.	45	31	44	40	55	33	75	12	88	27	101	44
Barrancas, Fort, Fla.....	74	10	85	27	85	34	86	48	98	61	96	61
Benicia Barracks, Cal.....	61	34	78	28	72	40	78	44	86	51	82	55
Bidwell, Fort, Cal.....	56	5	67	19	63	15	77	25	78	26	81	37
Brady, Fort, Mich.....	36	32	38	29	57	28	69	17	74	29	91	36
Bridger, Fort, Wyo.....	44	15	44	39	47	Zero.	57	14	73	20	84	30
Brown, Fort, Tex.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Buford, Fort, Dak.....	44	43	45	43	58.8	22.7	76	10	85.5	25.2	100	34
Columbus, Fort, N. Y. H.	45	6	56	6	62	7	(1)	(1)	85	42	92	49
Concho, Fort, Tex.....	73	5	83	17	89	26	96	32	95	44	100	53
David's Island, N. Y.....	47	4	54	3	61	4	67	30	86	39	93	44
Ellis, Fort, Mont.....	48	17	50	36	54	14	70	20	82	20	93	30
Fred Steele, Fort, Wyo.....	(1)	(1)	(1)	(1)	55	2	68	12	80	16	93	36
Gaston, Fort, Cal.....	62	26	74	30	72	33	80	38	96	36	90	42
Hamilton, Fort, N. Y. H.	50	2	54	5	62	5	70	31	85	42	91	45
Keogh, Fort, Mont.....	45	32	55	38	68	28	78	12	(1)	(1)	(1)	(1)
Klamath, Fort, Oreg.....	45	5	56	30	56	6	70	20	82	21	85	31
Lewis, Fort, Colo.....	50	14	48	31	51	1	60	13	71	22	84	35
Lyon, Fort, Colo.....	66	7	69	3	80	9	80	22	91	17	96	47
Madison Barracks, N. Y.	41	29	51	3	52	3	72	12	81	31	90	40
Mason, Fort, Cal.....	59	41	66	29	73	45	73	50	78	50	75	50
McDermitt, Fort, Nev.....	49	2	49	18	53	23	56	31	62	35	84	49
McDowell, Fort, Ariz.....	71	23	85.8	23.7	79.8	36.5	92	37	102.2	43.5	113	50
McHenry, Fort, Md.....	80	6	64	8	62	13	77	32	87	45	81	51
Meade, Fort, Dak.....	54	21	57	28	66	11	73	12	82	25	97	28
Mojave, Fort, Ariz.....	71	32	78	27	(1)	(1)	92	44	100	53	110	50
Monroe, Fort, Va.....	63	3	67	27	72	20	77	38	88	50	89	55
Mount Vernon Barracks, Ala.....	74	10	80	24	84	33	87	40	92	55	96	54
Niagara, Fort, N. Y.....	47	9	57	3	55	2	72	26	79	33	86	44
Pembina, Fort, Dak.....	34	35	34	37	39	26	66	9	83	29	(1)	(1)
Plattsburg Barracks, N. Y.....	45	27	49	3	51	5	66	15	79	36	86	40
Presidio, Cal.....	62	37	73	28	73	38	70	41	85	42	70	47
Randall, Fort, Dak.....	48	29	53	29	70	13	74	22	80	33	96	40
Reno, Fort, Ind. T.....	69	4	72	3	(1)	(1)	85	31	89	37	93	55
Robinson, Fort, Nebr.....	51	22	56	39	(1)	(1)	76	10	88	26	97	46
Saint Augustine, Fla.....	77	22	83	42	85	40	86	45	90	63	91	63
Shaw, Fort, Mont.....	51	15	53	32	55	22	71	31	81	27	91	45
Sisecton, Fort, Dak.....	45	44	42	29	46	23	65	16	79	27	89	44
Snelling, Fort, Minn.....	43	33	37	25	61	20	74	18	83	31	90	35
Spokane, Fort, Wash.....	51	5	49	32	65	8	77	29	91	30	96	37
Sully, Fort, Dak.....	52	30	57	30	73	6	75	20	85	33	90	47
Totten, Fort, Dak.....	35	39	38	31	42	21	65	10	82	29	96	45
Townsend, Fort, Wash.....	57	25	57	8	60	26	72	36	80	36	88	48
Union, Fort, N. Mex.....	65	13	67	21	63	9	73	15	79	12	86	33
West Point, N. Y.....	(1)	(1)	(1)	(1)	(1)	(1)	74	29	87	33	97	43
Wingate, Fort, N. Mex.....	51	7	56	8	59	11	69	18	77	26	87	34
Yates, Fort, Dak.....	42	44	49	38	56	14	79	19	83	34	87	48

1 No record.

APPENDIX 19.

of temperatures at military post hospitals for the year ending December, 31, 1884.
tering thermometers.]

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
°	°	°	°	°	°	°	°	°	°	°	°	°
86	42	96	43	82	30	80	10	65	-15	48	-43	141
74	48	85	48	69	46	68	47	70	48	65	38	46
88	51	85	52	80	51	83	47	76	46	72	32	65
(?)	(?)	85	57	80	31	85	10	70	-15	65	-50	-----
98	70	96	54	90	52	78	47	69	48	64	32	69
97	56	95	48	78	30	78	25	70	29	58	2	107
82	40	88	36	88	33	76	18	62	5	48	-24	123
83	37	88	31	78	19	75	15	55	14	60	-9	125
96	30	84	71	96	69	87	60	81	47	83	29	-----
95	77	97	89	82	24	86	11	63	-12	58	-43	145
95	38	102	56	86	50	84	31	63	19	60	8	-----
99	58	92	60	101	63	95	42	80	26	88	10	105
110	68	103	61	95	35	85	18	65	21	62	-7	102
92	46	94	87	85	25	81	18	67	-1	60	-13	119
98	36	98	88	87	26	76	9	62	2	55	-34	-----
98	23	91	46	87	40	76	34	73	35	68	16	86
102	41	102	52	95	45	89	30	62	21	60	-1	102
85	47	97	87	86	28	87	11	69	-24	55	-45	-----
94	45	108	(?)	78	16	78	11	(?)	(?)	54	-15	-----
87	30	(?)	38	75	22	70	20	60	12	58	-18	109
88	39	87	42	95	27	89	27	74	7	70	-21	127
104	52	104	42	87	30	79	19	59	4	57	-28	119
89	44	88	80	69	50	76	49	71	45	68	40	52
81	54	74	47	86	32	77	25	66	21	55	-2	113
80	43	95	50	103	51	(?)	(?)	89	34	80	24	-----
116	66	113	57	92	49	85	32	71	23	62	4	89
88	61	90	84	83	20	86	18	71	-12	78	-32	129
95	40	96	68	103	55	95	47	85	37	79	80	-----
112	67	114	64	80	58	80	38	73	30	69	9	90
98	63	90										-----
98	64	101	58	97	57	96	36	78	27	80	15	91
98	50	92	45	90	44	81	25	62	15	54	Zero.	101
(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	58	-19	44	-47	-----
90	46	96	42	92	34	79	26	58	8	53	-19	123
98	46	75	48	78	43	77	43	71	44	(?)	(?)	-----
95	47	96	44	97	36	89	18	78	-4	58	-31	128
101	62	101	58	98	52	90	35	76	19	68	-1	-----
101	40	97	42	94	52	87	14	73	-8	(?)	(?)	-----
98	63	91	70	80	66	86	53	77	40	80	35	71
85	38	92	37	82	21	80	21	68	-4	(?)	(?)	-----
85	44	85	41	86	32	78	12	62	-22	42	-38	133
85	45	101	45	95	38	85	19	61	-15	46	-37	138
95	46	108	44	81	31	71	24	(?)	(?)	(?)	(?)	-----
98	42	98	48	98	35	99	19	72	-7	59	-37	137
100	51	94	44	88	34	85	12	61	-21	45	-40	136
86	43	84	45	87	37	64	33	68	28	56	11	80
78	45	86	43	82	33	(?)	(?)	67	14	67	-10	-----
96	47	82	43	95	45	(?)	(?)	64	18	64	-12	-----
94	54	87	43	81	30	76	24	59	13	56	-4	101
92	48	87	45	90	29	89	11	68	-31	52	-37	141

¹ No record.

APPENDIX 20.

Monthly and annual mean temperatures (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads, and connecting branches, for the year ending December 31, 1884.

[The daily mean is obtained by dividing the sum of the maximum and minimum temperatures by two; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
Alta, Cal.	43.2	39.4	43.2	47.0	58.0	61.9	66.8	72.6	58.8	55.7	57.4	41.0	54.0
Anaheim, Cal.	57.0	60.4	63.3	65.0	69.2	71.5	75.4	69.0	68.5	58.9	54.1	61.7	
Antioch, Cal.	43.5	44.8	48.7	53.2	64.6	67.6	73.3	73.6	66.4	59.3	52.6	45.8	58.0
Aptos, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	62.4	60.3	60.2	53.4	51.8	49.9	
Auburn, Cal.	65.3	43.8	48.7	51.9	62.1	63.5	72.0	76.6	64.2	58.7	53.6	45.3	57.1
Battle Mountain, Nev.	28.9	21.0	40.1	45.7	61.9	66.2	74.3	76.6	58.8	48.9	38.2	34.2	48.2
Benson, Ariz.	45.4	54.1	57.0	64.1	75.4	(1)	92.0	84.5	76.5	70.2	56.3	48.7	
Brownsville, Nev.	25.6	24.1	37.6	46.3	57.6	64.6	72.5	75.4	57.1	50.5	39.7	31.8	48.6
Bishop's Creek, Nev.	(1)	(1)	45.4	57.4	65.8	69.9	85.5	80.9	64.6	60.9	48.7	49.4	
Blue Creek, Utah	23.5	26.0	33.8	45.8	60.4	69.3	71.3	75.8	60.2	50.2	42.0	30.2	48.5
Boca, Cal.	22.6	18.7	30.0	37.4	49.0	56.2	60.7	64.6	51.1	46.0	35.8	31.6	42.0
Borden, Cal.	49.2	53.0	52.8	60.1	68.8	69.5	77.6	86.5	69.6	58.2	58.4	50.6	63.4
Brentwood, Cal.	45.5	46.4	53.6	54.4	64.0	66.7	76.3	76.9	67.5	65.5	54.6	46.0	60.0
Brighton, Cal.	47.2	48.4	54.0	57.8	66.9	68.3	72.9	76.4	66.7	60.3	55.7	48.5	60.3
Brown's, Nev.	30.5	30.4	44.0	52.6	68.0	74.1	82.4	83.9	65.6	54.5	42.6	36.9	55.5
Byron, Cal.	47.2	50.0	59.8	58.3	68.3	70.9	82.1	81.3	69.6	63.0	59.0	51.2	63.4
Cabazon, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	82.5	78.4	68.6	62.2	49.4	
Callente, Cal.	47.7	49.5	54.8	55.2	70.0	70.9	82.5	81.7	72.0	64.1	52.0	47.6	62.3
Callistoga, Cal.	45.3	45.6	50.3	53.2	64.8	67.2	72.2	72.2	64.2	59.8	53.2	48.7	58.3
Carlin, Nev.	17.9	17.9	34.2	42.5	55.4	62.9	68.1	68.3	51.9	45.6	33.2	20.8	43.7
Casa Grande, Ariz.	53.2	50.4	59.1	68.1	80.5	88.6	98.7	91.5	83.4	76.8	66.6	54.5	73.0
Chico, Cal.	46.6	44.4	53.8	60.7	71.2	70.2	81.1	86.7	60.1	58.4	57.5	50.6	62.8
Chualar, Cal.	48.8	49.5	51.5	54.3	(2)	57.7	61.0	59.7	56.9	53.1	51.3	49.2	
Cisco, Cal.	32.8	27.5	31.2	34.3	43.4	51.0	63.1	63.1	48.9	45.5	42.6	29.9	42.6
Colfax, Cal.	45.6	44.1	46.9	49.9	62.6	63.0	73.8	77.2	65.7	59.0	55.9	48.2	57.5
Colton, Cal.	49.3	55.3	61.2	59.1	66.0	69.6	75.4	76.8	65.8	59.5	55.9	50.7	62.0
Corinne, Utah	22.9	25.8	39.3	49.5	61.4	72.5	77.8	77.4	59.5	51.6	39.1	32.9	50.9
Daggett, Cal.	46.2	48.1	50.8	56.4	66.9	77.3	88.7	86.8	(3)				
Davis, Cal.	44.6	49.2	57.2	61.5	74.5	74.2	82.5	86.3	61.9	64.6	60.1	51.4	64.0
Delano, Cal.	44.8	49.0	47.2	53.5	(2)	70.2	80.9	83.6	71.8	61.1	60.2	50.5	
Delta, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	55.8	48.7	40.0	
Deming, N. Mex.	43.8	48.0	57.7	61.4	69.8	77.5	85.6	81.1	73.8	69.9	54.8	53.1	64.9
Dunnigan, Cal.	48.6	49.2	56.0	64.6	69.8	71.9	80.7	79.2	72.8	61.7	54.5	47.5	63.0
Elko, Nev.	20.6	18.0	35.3	45.6	58.1	65.8	71.0	68.6	51.5	44.0	31.7	29.3	45.0
El Paso, Tex.	39.5	41.4	46.4	51.8	64.3	(1)	(1)	83.8	(1)	64.0	47.4	41.0	
Emigrant Gap, Cal.	35.5	31.7	36.2	38.4	50.8	53.9	62.0	62.1	52.9	50.6	48.7	37.2	46.7
Farmington, Cal.	45.4	48.2	52.6	57.9	67.0	70.5	72.6	72.6	69.2	62.2	54.4	46.0	59.9
Fenner, Cal.	40.0	48.9	54.5	64.2	73.3	84.4	80.6	(1)	79.0	(2)			
Fresno, Cal.	46.7	49.5	54.3	59.4	70.9	73.5	82.5	(1)	71.1	65.8	60.9	55.7	
Galt, Cal.	47.7	48.8	56.6	60.0	66.7	75.4	78.6	71.3	66.8	56.2	53.4	49.0	60.9
Gilroy, Cal.	46.5	48.4	54.1	56.8	63.0	65.2	71.9	69.9	65.6	60.0	53.8	49.6	58.7
Golconda, Nev.	31.6	30.2	44.0	53.2	64.7	(1)	76.5	81.7	63.9	58.9	47.3	40.1	
Goshen, Cal.	47.8	53.1	56.3	59.4	70.0	71.1	85.5	88.8	77.2	62.2	54.8	48.9	64.6
Halleck, Nev.	15.7	17.9	38.1	43.8	53.1	58.0	66.1	62.5	(1)	51.4	24.8	28.1	
Hawthorne, Nev.	(1)	(1)	49.0	57.0	68.4	73.9	82.4	83.1	61.6	55.2	49.2	39.2	
Hollister, Cal.	49.6	53.3	53.1	56.0	62.9	67.4	70.6	69.5	66.2	61.6	57.3	52.4	60.0
Hotel del Monte, Cal.	49.5	50.6	54.5	57.0	59.7	61.1	61.0	61.1	57.5	54.4	52.2	50.0	55.9
Hot Springs, Nev.	28.9	26.5	40.5	48.9	65.2	60.7	67.7	72.6	54.0	49.5	41.2	34.0	43.1
Humboldt, Nev.	28.2	25.9	40.4	48.8	60.4	67.8	68.9	(1)	51.7	38.1	35.9	25.3	
Indio, Cal.	52.3	56.4	61.7	67.9	76.0	82.5	93.3	91.7	82.1	74.6	62.6	51.9	71.9
Ione, Cal.	52.4	53.2	55.9	66.7	69.7	68.7	75.6	82.2	70.1	62.9	53.2	60.0	63.4
Keeler, Cal.	(1)	(1)	(1)	65.6	77.1	82.9	93.5	91.1	80.8	67.9	57.5	41.8	
Keene, Cal.	42.7	41.2	45.1	50.5	60.1	67.2	75.9	74.2	59.3	55.6	52.6	42.0	55.5
Kelton, Utah	20.2	23.8	37.1	45.4	59.9	70.8	75.4	72.3	56.0	(1)	35.6	32.4	
Kingsburg, Cal.	56.2	53.5	56.4	61.7	71.5	75.8	83.6	84.7	72.2	66.0	60.9	51.0	66.1
Knight's Landing, Cal.	49.4	47.7	54.0	58.0	67.2	70.6	75.0	(1)	67.6	63.0	58.9	52.1	
Lathrop, Cal.	43.5	47.8	52.4	57.9	63.6	64.8	69.1	(1)	73.0	67.6	49.9	46.3	
Lemoore, Cal.	52.1	48.6	51.9	54.1	71.6	72.7	81.6	85.9	(1)	69.7	58.2	46.7	

¹ No record.

² Record incomplete.

³ Observations discontinued.

Monthly and annual mean temperatures (in degrees Fahrenheit) at stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
Livermore, Cal.	49.7	49.2	54.1	54.4	58.8	62.2	67.6	67.5	63.8	60.2	55.5	50.0	57.8
Lordsburg, N. Mex.	32.5	46.1	51.5	62.7	77.1	85.7	91.8	80.4	74.8	62.2	49.9	42.6	63.2
Los Angeles, Cal.	59.2	60.1	62.0	63.8	66.3	70.0	74.9	76.8	71.0	67.8	64.8	58.8	66.0
Mammoth Tank, Cal.	54.7	59.0	54.9	68.8	85.0	92.9	99.8	100.1	89.9	80.3	66.9	54.5	75.1
Mariopca, Ariz.	48.0	55.8	59.5	68.1	81.9	89.6	97.7	89.9	79.5	71.9	50.3	55.9	71.1
Martinez, Cal.	43.8	44.4	54.1	54.8	61.2	63.6	66.6	65.7	59.5	55.5	51.4	47.0	56.2
Marysville, Cal.	43.7	48.0	55.8	67.6	69.1	70.8	76.9	82.4	80.2	67.2	55.9	49.2	63.8
Menlo Park, Cal.	46.4	48.1	53.2	57.2	65.6	65.3	69.8	66.0	59.6	(¹)	53.3	48.3	.....
Merced, Cal.	47.4	48.9	51.5	59.7	66.4	70.6	77.6	79.0	62.0	63.0	59.9	50.3	61.4
Modesto, Cal.	40.4	46.4	52.2	56.2	65.5	67.6	80.7	(¹)	69.4	64.6	62.2	46.0	.....
Mojave, Cal.	45.8	45.2	52.3	51.8	55.3	60.2	77.0	76.8	(¹)	73.4	(¹)	(¹)	.....
Monterey, Cal.	50.1	50.6	55.9	57.9	60.8	62.5	62.6	62.4	59.3	57.5	53.4	51.5	57.0
Napa, Cal.	48.8	52.0	52.8	51.8	68.2	69.2	66.7	67.0	(¹)	55.2	53.5	48.6	.....
Needles, Ariz.	51.7	53.8	60.7	68.8	77.8	80.3	93.7	89.2	78.2	(¹)	.....	.....	.....
Newhall, Cal.	48.4	48.9	51.4	46.0	62.9	68.1	73.8	76.8	65.7	60.5	56.5	47.3	58.8
Niles, Cal.	46.6	49.2	53.1	54.8	60.9	62.5	68.4	67.8	65.0	57.4	51.0	48.1	57.0
Oakland, Cal.	49.0	49.2	53.4	55.5	58.0	60.3	61.5	58.9	58.8	56.5	54.8	51.2	55.6
Ogden, Utah	24.4	28.4	41.4	50.7	64.3	75.9	78.8	77.2	61.3	51.6	39.5	34.9	52.4
Orland, Cal.	49.2	50.1	55.4	59.4	72.4	73.8	84.7	85.4	72.8	67.4	59.1	52.7	65.2
Otego, Nev.	19.6	19.3	33.0	44.9	54.9	64.9	72.5	72.9	58.8	45.2	37.9	25.4	45.8
Pajaro, Cal.	48.8	52.9	52.8	54.6	60.3	62.9	63.0	64.0	59.4	56.1	54.0	49.2	56.5
Palmdale, Nev.	24.6	20.0	38.2	47.2	63.3	72.9	77.8	73.9	75.4	41.4	29.1	22.0	47.6
Pantano, Ariz.	49.4	51.1	55.0	56.2	66.1	(¹)	86.3	80.8	75.7	68.5	60.4	58.0	.....
Petaluma, Cal.	45.8	47.7	53.0	56.6	62.1	63.0	65.5	66.0	62.8	(¹)	55.4	51.8	.....
Pleasanton, Cal.	44.6	46.0	51.1	57.6	63.7	63.7	73.6	75.3	68.2	65.5	60.5	49.9	60.0
Promontory, Utah	31.5	22.9	37.6	46.9	58.4	72.5	79.8	71.6	61.8	52.3	(¹)	26.1	.....
Ravenna, Cal.	46.6	45.9	48.5	54.4	63.0	65.8	73.2	80.5	67.5	59.7	58.0	47.0	58.7
Red Bluff, Cal.	45.4	45.2	50.7	56.6	69.6	71.3	81.1	83.1	70.0	65.7	58.4	48.6	62.2
Redding, Cal.	(¹)	(¹)	(¹)	59.9	63.9	67.8	70.8	(¹)	72.6	65.6	59.1	44.9	.....
Reno, Nev.	27.5	25.7	37.1	41.9	54.5	62.8	69.3	68.7	53.4	47.4	41.8	35.4	47.1
Rocklin, Cal.	48.6	47.8	53.0	57.6	66.9	69.2	75.3	81.3	(¹)	58.6	(¹)	45.2	.....
Sacramento, Cal.	46.7	47.9	54.3	59.9	68.6	70.4	75.1	75.2	65.3	59.8	54.7	48.6	60.5
Salinas, Cal.	46.4	49.3	53.9	56.4	63.3	63.9	62.4	63.1	61.4	58.9	52.7	49.0	56.8
San Fernando, Cal.	52.7	52.9	53.6	57.8	63.1	(¹)	72.4	75.0	67.9	62.4	60.3	50.4	.....
San José, Cal.	47.8	48.6	52.6	55.2	62.3	61.6	65.4	65.6	62.0	(¹)	54.5	51.7	.....
San Mateo, Cal.	44.8	45.8	50.2	58.0	58.2	60.8	64.3	60.2	59.8	54.1	52.5	48.9	54.5
San Simon, Ariz.	45.6	51.7	58.7	62.7	73.5	61.8	88.4	81.3	78.3	71.3	61.0	46.5	66.7
Santa Cruz, Cal.	52.5	53.4	55.7	57.7	62.6	63.9	65.1	66.1	62.6	60.1	56.3	54.0	59.2
Soledad, Cal.	45.4	49.7	53.2	58.4	65.8	65.9	65.8	66.2	60.3	57.5	51.9	45.9	57.2
Soquel, Cal.	55.5	50.9	53.5	54.4	63.6	69.9	65.9	(¹)	62.6	56.3	55.3	49.3	.....
South Vallejo, Cal.	54.4	52.2	56.4	68.2	65.6	66.7	70.0	66.9	(¹)	63.0	61.0	54.2	.....
Spadra, Cal.	53.2	54.8	56.2	62.0	65.4	70.7	72.5	77.5	70.7	62.9	61.1	58.5	63.8
Stockton, Cal.	46.4	45.9	53.1	57.8	63.1	64.1	69.9	73.7	63.0	59.4	54.7	48.6	58.3
Suisun, Cal.	37.4	50.5	56.2	59.6	65.6	68.5	73.0	72.7	68.3	63.2	55.4	50.1	59.0
Summit, Cal.	26.3	25.1	29.5	31.6	39.7	44.2	53.9	57.2	45.7	42.2	38.6	28.1	39.5
Summer, Cal.	51.2	57.8	56.8	59.6	67.7	76.1	81.8	87.1	73.1	61.6	58.0	49.4	65.0
Tecoma, Nev.	15.1	20.2	38.3	44.8	59.9	65.2	70.7	69.9	48.4	48.7	(¹)	31.3	.....
Tehama, Cal.	45.8	47.0	54.2	56.1	(¹)	68.9	73.6	78.8	(¹)	66.6	62.0	46.7	.....
Tehichipa, Cal.	41.9	39.3	44.0	48.4	55.3	59.6	65.0	71.7	60.1	58.4	51.5	38.8	52.8
Tennant, Cal.	49.8	50.1	52.7	56.4	64.8	64.8	69.4	72.5	64.0	61.9	58.6	48.4	59.4
Terrace, Utah	25.3	25.6	40.7	47.0	67.0	70.1	78.4	74.4	52.0	(¹)	40.9	30.9	.....
Texas Hill, Ariz.	52.5	55.5	62.3	66.4	80.2	88.9	96.9	98.6	84.7	73.8	61.2	51.6	72.7
Toano, Nev.	21.4	22.4	35.4	42.2	52.0	60.8	68.1	69.5	51.4	48.4	38.8	24.4	44.6
Tracy, Cal.	47.6	50.7	56.2	61.8	70.2	74.2	81.1	82.1	71.4	65.7	55.4	48.2	63.7
Truckee, Cal.	25.6	21.9	30.6	39.7	50.8	56.0	63.2	65.6	(¹)	44.1	37.3	28.1	.....
Union, Ariz.	49.7	63.0	65.2	71.8	75.5	85.8	92.4	85.2	83.4	74.7	64.4	54.2	72.1
Tulare, Cal.	46.8	53.0	54.6	60.8	70.7	74.7	81.4	83.4	70.9	62.0	56.8	47.5	63.4
Turlock, Cal.	47.0	50.3	55.1	60.1	75.4	75.3	83.8	82.1	68.2	58.6	52.8	50.7	64.0
Wadsworth, Nev.	38.6	32.6	44.8	52.7	65.2	68.9	78.4	74.1	62.9	52.3	45.3	37.5	54.0
Wells, Nev.	20.0	19.9	33.4	42.0	53.4	60.1	67.9	68.6	69.2	64.0	57.7	43.2	43.5
Willcox, Ariz.	42.3	49.8	51.3	59.5	67.3	76.3	85.4	79.2	73.0	64.5	52.1	43.2	62.0
Williams, Cal.	46.9	47.2	52.6	58.7	71.2	69.9	77.7	80.6	69.2	64.0	57.7	46.1	61.8
Willow, Cal.	47.4	48.0	58.9	58.2	64.7	76.9	78.2	79.6	68.1	62.4	57.2	45.8	61.5
Winnemucca, Nev.	23.4	20.2	38.0	46.8	63.9	72.3	88.8	83.1	58.0	48.8	43.4	34.4	51.5
Woodland, Cal.	46.6	45.6	54.2	56.1	66.5	69.3	79.2	80.4	72.0	(¹)	59.0	51.1	.....
Yuma, Ariz.	56.6	58.9	60.9	67.4	77.9	(¹)	94.5	92.1	(¹)	73.3	63.7	55.8	.....

¹ No record.

² Observations discontinued.

APPENDIX 21.

Monthly maximum and minimum temperatures, in degrees Fahrenheit, and annual range of branches, for the year end

[From self-regis]

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Alta, Cal.	60	30	70	16	60	28	68	30	80	46	86	44
Anaheim, Cal.	72	42	89	40	90	36	80	50	92	54	90	54
Antioch, Cal.	60	26	68	22	72	34	72	38	84	50	86	52
Aptos, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Auburn, Cal.	65	31	73	20	70	32	78	40	84	50	88	50
Battle Mountain, Nev.	42	10	53	30	65	24	72	30	85	42	90	50
Benson, Ariz.	67	20	78	30	78	38	84	48	91	54	(1)	(1)
Beowawe, Nev.	42	10	50	23	54	22	72	33	80	37	87	50
Bishop's Creek, Nev.	(1)	(1)	(1)	(1)	63	32	85	35	90	45	85	63
Blue Creek, Utah.	48	7	49	15	54	25	60	34	84	33	92	42
Boca, Cal.	50	14	45	39	45	2	55	20	68	30	80	40
Borden, Cal.	80	26	97	28	101	34	94	40	104	45	102	45
Brentwood, Cal.	61	28	67	22	76	35	71	42	84	49	90	53
Brighton, Cal.	71	30	74	25	80	41	80	47	92	55	95	55
Brown's, Nev.	51	10	58	16	62	28	74	34	95	52	96	54
Byron, Cal.	62	30	74	26	76	40	76	43	90	50	94	56
Cabazon, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Caliente, Cal.	70	31	70	28	74	32	70	43	90	50	94	50
Calistoga, Cal.	79	26	78	17	75	31	75	40	90	51	92	55
Carlin, Nev.	44	22	44	34	54	20	66	30	80	34	90	44
Casa Grande, Ariz.	70	32	73	28	75	45	86	52	102	56	113	68
Chico, Cal.	60	30	78	20	76	84	85	48	85	56	97	54
Chualar, Cal.	70	26	85	31	70	37	80	40	98	40	80	40
Cisco, Cal.	44	16	44	Zero.	44	16	42	25	83	32	76	35
Colfax, Cal.	62	34	75	22	68	38	72	36	86	40	90	48
Colton, Cal.	74	31	93	30	90	44	80	43	92	48	103	48
Corinne, Utah.	49	3	58	15	57	24	76	34	84	39	96	56
Daggett, Cal.	70	20	70	20	70	32	80	38	89	53	98	52
Davis, Cal.	62	27	86	28	88	42	86	46	96	49	98	52
Delano, Cal.	62	28	60	36	56	40	74	46	(1)	(1)	97	(1)
Delta, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Deming, N. Mex.	60	20	80	25	81	44	75	50	89	50	96	61
Dunnigan, Cal.	69	30	82	30	90	37	88	41	92	57	92	48
Elko, Nev.	48	25	50	35	57	15	70	31	88	39	90	50
El Paso, Tex.	65	8	72	20	78	28	90	80	100	35	(1)	(1)
Emigrant Gap, Cal.	51	26	60	6	60	22	58	29	66	40	78	28
Farmington, Cal.	60	27	68	22	69	40	79	46	96	57	94	55
Fenner, Cal.	67	29	79	22	71	40	87	45	96	50	112	65
Fresno, Cal.	66	30	72	29	76	38	81	46	95	52	102	56
Galt, Cal.	65	30	68	22	72	40	77	45	90	50	93	57
Gilroy, Cal.	68	23	75	28	75	40	78	43	88	50	98	53
Golconda, Nev.	55	6	71	17	75	31	80	37	91	45	(1)	(1)
Goshen, Cal.	70	20	78	37	78	38	84	40	98	50	103	50
Halleck, Nev.	40	35	52	45	58	8	64	28	79	39	88	39
Hawthorne, Nev.	(1)	(1)	(1)	(1)	68	36	78	40	91	54	92	56
Hollister, Cal.	64	30	78	28	78	37	80	37	89	52	90	53
Hotel del Monte, Cal.	64	31	74	28	70	40	71	45	78	50	80	54
Hot Springs, Nev.	50	3	58	32	64	26	75	30	90	32	95	32
Humboldt, Nev.	52	1	70	22	65	20	57	39	72	45	93	59
Indio, Cal.	78	32	88	32	81	49	96	51	103	60	106	65
Ione, Cal.	83	29	81	25	89	38	90	46	94	50	90	40
Keeler, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	86	50	98	54	105	60
Keene, Cal.	58	22	72	16	65	28	75	30	86	41	88	41
Kelton, Utah.	46	8	54	20	54	24	68	(1)	88	40	92	32
Kingsburg, Cal.	82	33	90	33	90	39	90	43	98	50	95	61
Knight's Landing, Cal.	68	30	75	35	70	40	79	48	86	54	87	54
Lathrop, Cal.	60	27	55	36	70	38	76	46	84	52	87	52
Lemoore, Cal.	73	30	84	26	66	34	84	44	95	52	95	53
Livermore, Cal.	70	28	84	36	76	32	78	42	85	47	88	53
Lordsburg, N. Mex.	65	8	80	20	78	30	84	42	95	55	105	70
Los Angeles, Cal.	86	43	89	45	81	46	78	54	78	53	95	36
Mammoth Tank, Cal.	74	33	85	30	86	48	101	52	113	62	128	73

¹ No record.

² Record incomplete.

³ Observations discontinued.

APPENDIX 21.

Temperature, at stations on the Central Pacific and Southern Pacific Railroads, and connecting
ing December 31, 1884.

tering thermometers.]

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
0	0	0	0	0	0	0	0	0	0	0	0	0
90	50	90	50	86	40	80	34	78	40	70	20	74
92	62	96	50	96	50	100	48	87	40	70	20	84
96	56	94	38	90	50	86	40	78	34	66	20	76
90	48	76	52	74	45	70	40	75	37	70	25	
95	54	96	56	93	48	82	40	76	39	71	22	78
95	60	99	58	88	38	78	28	66	16	54	-1	129
108	70	102	70	98	58	89	48	78	36	74	30	
94	55	98	60	96	40	78	25	68	15	57	-8	121
100	75	95	70	80	50	79	42	70	24	63	20	
98	39	98	59	82	30	74	30	60	28	46	6	113
92	38	92	40	90	30	75	21	70	11	60	-10	181
112	50	116	54	108	50	88	48	76	32	76	28	91
95	60	100	65	98	53	90	54	73	39	67	28	78
99	63	105	57	101	52	99	45	35	38	73	22	83
100	54	100	70	98	46	78	36	64	24	62	6	116
100	64	105	62	92	54	80	48	74	48	68	26	79
(1)	(1)	104	62	90	52	90	50	32	46	76	30	
100	60	100	62	98	50	90	40	70	30	60	32	72
90	55	100	55	92	42	87	40	78	31	73	19	83
94	48	92	48	56	32	76	24	68	8	50	-12	128
118	83	108	73	100	65	98	53	36	48	73	34	90
105	67	111	65	95	50	78	48	75	35	74	25	91
92	45	90	40	90	40	90	37	90	37	70	20	78
78	40	79	24	79	30	69	25	56	24	49	8	79
94	52	97	58	91	48	86	40	76	40	75	26	75
103	48	110	50	98	50	92	40	82	36	68	30	80
95	60	95	56	90	12	78	30	62	22	48	8	110
104	70	104	64	(1)	(1)	(2)	(2)					
116	62	110	68	106	54	92	44	37	31	33	25	85
102	45	101	63	98	58	88	48	78	42	79	42	
(1)	(1)	(1)	(1)	(1)	(1)	70	42	64	36	65	22	
106	70	95	70	94	60	85	48	74	45	75	20	86
90	60	103	60	96	56	80	48	73	36	63	22	81
96	51	97	47	90	23	75	18	68	8	57	-15	133
(1)	(1)	102	70	(1)	(1)	88	40	70	28	74	28	
92	48	86	48	80	37	71	30	66	52	64	18	80
104	64	108	61	100	51	86	44	76	33	69	22	86
112	70	(1)	(1)	102	64	(2)	(2)					
106	62	(1)	(1)	95	53	89	51	80	36	70	32	
100	66	104	62	89	51	81	40	76	32	67	25	82
102	53	96	53	90	50	90	45	76	35	72	18	84
100	58	105	60	98	41	88	32	80	19	50	2	
106	70	107	65	99	60	90	46	82	52	70	21	87
90	42	101	37	(1)	(1)	80	34	86	8	78	-15	
96	65	96	70	82	48	80	38	75	30	70	10	
96	54	98	53	90	50	83	46	78	37	72	26	72
76	53	77	50	77	44	77	40	71	40	68	30	50
95	33	99	52	90	38	60	28	70	14	60	-10	131
90	48	(1)	(1)	68	38	54	26	53	16	58	-10	
112	82	112	74	104	58	97	52	91	40	88	28	84
100	50	106	50	100	50	90	43	84	31	77	20	86
107	84	108	78	104	68	94	48	78	42	56	30	
94	55	98	46	86	38	83	30	75	30	70	12	86
96	58	100	54	84	40	(1)	(1)	61	20	60	5	
105	65	106	60	100	52	80	48	82	46	73	25	81
101	60	(1)	(1)	96	54	83	42	84	36	30	26	
95	55	(1)	(1)	85	45	82	44	72	50	67	22	
101	70	107	70	(1)	(1)	78	50	74	34	65	20	
100	54	100	51	95	49	98	42	82	36	30	28	74
110	70	102	70	92	60	86	40	68	38	65	22	102
91	65	96	62	93	60	95	54	92	46	38	35	61
126	78	128	85	115	70	106	58	96	54	84	40	96

Monthly maximum and minimum temperatures and annual range of temperature at

Stations.	January.		February.		March.		April.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Maricopa, Ariz.....	73	14	67	40	76	46	89	40	100	60	115	72
Martinez, Cal.....	65	28	65	26	68	40	73	44	80	50	80	52
Marysville, Cal.....	60	30	79	25	75	38	89	49	90	51	94	53
Menlo Park, Cal.....	60	28	74	24	72	36	76	45	86	54	80	55
Merced, Cal.....	66	28	70	26	72	38	80	44	88	50	96	48
Modesto, Cal.....	65	30	71	29	73	39	81	49	91	50	95	50
Mojave, Cal.....	86	26	73	20	80	30	85	29	82	30	90	40
Monterey, Cal.....	66	30	74	25	72	37	73	42	79	52	70	56
Napa, Cal.....	71	28	74	18	69	32	81	41	85	47	94	52
Needles, Ariz.....	67	32	78	26	76	44	90	50	100	57	110	66
Newhall, Cal.....	76	22	79	28	70	32	80	40	82	45	102	51
Niles, Cal.....	65	32	75	32	73	40	72	41	92	43	87	51
Oakland, Cal.....	58	38	72	32	68	44	70	44	72	49	76	54
Ogden, Utah.....	52	-6	54	-24	60	26	52	34	90	25	100	50
Orland, Cal.....	70	34	78	26	78	30	84	44	98	56	96	54
Otego, Nev.....	42	-10	44	-23	46	10	64	32	74	32	88	44
Pajaro, Cal.....	70	35	80	32	78	32	76	38	88	50	80	54
Palisade, Nev.....	46	-6	49	-30	56	20	76	30	88	35	94	46
Pantano, Ariz.....	85	34	74	35	80	37	77	45	90	40	(¹)	(¹)
Petaluma, Cal.....	62	24	78	23	73	38	78	46	94	50	82	52
Pleasanton, Cal.....	68	23	70	23	73	34	79	41	92	50	85	47
Promontory, Utah.....	48	-7	55	-32	55	23	75	35	88	31	100	45
Ravenna, Cal.....	64	20	74	26	68	32	78	38	92	50	100	50
Red Bluff, Cal.....	78	30	76	26	74	36	76	46	90	48	96	53
Redding, Cal.....	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	75	50	76	50	90	57
Reno, Nev.....	49	-2	50	-14	50	22	59	32	76	36	84	44
Rocklin, Cal.....	64	36	75	22	70	39	74	44	88	53	90	57
Sacramento, Cal.....	58	33	70	26	70	39	75	50	85	56	89	57
Sa Inas, Cal.....	62	30	65	27	68	40	68	46	80	52	78	56
San Fernando, Cal.....	71	30	86	35	70	40	76	42	88	55	(¹)	(¹)
San José, Cal.....	70	30	71	28	72	39	71	44	81	48	80	52
San Mateo, Cal.....	59	31	68	28	65	38	68	48	80	50	74	54
San Simon, Ariz.....	69	20	74	20	78	32	82	45	94	48	102	64
Santa Cruz, Cal.....	68	36	78	32	79	38	79	41	80	51	82	53
Soledad, Cal.....	66	26	76	26	80	34	78	44	90	50	84	54
Soquel, Cal.....	78	38	76	28	74	38	70	40	82	50	88	56
South Vallejo, Cal.....	75	39	70	35	71	47	74	46	88	53	82	55
Spadra, Cal.....	68	30	93	32	80	43	87	46	91	50	96	56
Stockton, Cal.....	60	32	65	26	62	40	71	46	80	52	84	54
Stinson, Cal.....	62	18	78	26	80	39	84	46	94	50	88	56
Summit, Cal.....	36	16	43	-7	45	11	42	20	50	30	60	32
Sumner, Cal.....	73	37	78	40	80	39	70	52	94	50	98	56
Tecoma, Nev.....	45	-15	55	-26	60	20	68	26	82	32	90	45
Tehama, Cal.....	60	32	80	30	72	36	78	42	(¹)	(¹)	100	50
Tehichipa, Cal.....	58	20	60	9	60	28	64	30	79	35	81	47
Tennant, Cal.....	66	28	79	25	73	34	79	40	86	48	84	48
Terrace, Utah.....	50	-4	60	-20	61	22	62	34	92	50	93	54
Texas Hill, Ariz.....	74	28	88	30	85	49	98	50	108	66	118	67
Toano, Nev.....	46	-18	50	-22	52	28	62	30	74	35	88	28
Tracy, Cal.....	64	28	76	28	30	40	80	46	90	56	97	56
Truckee, Cal.....	50	-1	44	-26	47	8	58	23	72	32	81	42
Tucson, Ariz.....	79	31	88	41	86	45	90	56	98	51	109	70
Tulare, Cal.....	65	31	72	32	71	41	96	70	98	58	100	60
Turlock, Cal.....	72	25	79	22	82	32	94	42	96	58	94	53
Wadsworth, Nev.....	58	8	60	-10	64	28	73	40	84	50	94	50
Wells, Nev.....	46	-12	42	-22	50	12	62	22	78	32	82	34
Willcox, Ariz.....	72	10	85	22	80	27	81	39	92	44	104	56
Williams, Cal.....	64	33	80	26	78	34	76	48	95	58	92	56
Willow, Cal.....	62	32	67	32	81	35	79	36	90	40	107	43
Winnemucca, Nev.....	50	-6	48	-27	65	23	78	30	97	44	99	50
Woodland, Cal.....	66	30	72	29	69	30	74	46	85	56	94	56
Yuma, Ariz.....	69	44	82	37	81	43	95	45	98	63	(¹)	(¹)

¹ No record.

² Record incomplete.

stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.

July.		August.		September.		October.		November.		December.		Annual range.
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
112	71	106	72	99	59	98	46	84	37	82	30	101
90	59	88	58	83	40	70	44	68	40	60	32	64
101	61	108	50	100	57	91	48	80	35	80	26	78
96	56	89	58	83	44	(1)	(1)	70	35	64	24	.....
106	56	104	58	94	48	86	42	84	38	80	24	82
108	61	(1)	(1)	98	50	90	45	90	39	70	25	.....
99	50	100	51	(1)	(1)	97	54	(1)	(1)	(1)	(1)	.....
90	54	77	53	77	50	81	40	72	39	69	29	55
100	50	96	50	(1)	(1)	81	38	75	30	67	18	.....
114	76	106	74	96	62	(9)	(9)	.....	.....	.....	.....	.....
100	54	107	58	99	50	92	40	86	35	64	26	85
97	54	98	52	89	54	86	43	74	40	65	30	67
74	54	71	54	70	48	68	42	66	42	68	32	44
96	55	106	55	95	42	80	30	62	22	52	10	130
106	66	110	68	102	54	90	54	80	40	72	32	84
92	54	90	56	82	28	66	30	62	18	58	-14	114
82	52	81	55	83	39	87	32	80	37	80	25	63
100	50	90	60	90	31	60	22	58	9	56	-20	130
106	74	105	65	104	60	98	50	82	47	76	35	.....
96	55	98	42	90	46	(1)	(1)	74	36	72	24	.....
96	59	99	58	94	52	85	45	78	34	68	20	79
105	60	106	54	96	43	72	30	(1)	(1)	49	-6	.....
100	52	106	52	102	48	84	37	78	30	78	30	86
102	62	112	62	100	54	95	51	86	43	74	26	86
102	48	(1)	(1)	91	60	85	50	79	42	69	28	.....
96	55	96	58	84	34	68	26	64	26	57	10	112
95	60	104	67	(1)	(1)	80	43	(1)	(1)	64	25	.....
96	62	97	60	89	54	77	45	78	39	65	30	71
88	54	74	55	84	52	84	40	68	43	72	26	62
91	62	104	54	98	50	91	45	89	45	82	31	.....
94	32	90	53	84	48	(1)	(1)	72	37	72	30	.....
86	55	76	51	78	50	76	43	68	39	64	26	88
106	76	101	65	95	60	90	52	86	42	72	30	88
89	58	91	52	88	48	85	44	80	44	74	34	59
96	54	94	50	80	40	81	42	78	36	76	22	74
86	52	(1)	(1)	82	44	76	42	74	30	70	26	.....
85	58	96	57	(1)	(1)	84	50	76	43	69	32	.....
102	56	106	58	98	55	96	44	82	46	88	32	78
95	56	96	56	88	46	80	46	76	38	65	30	72
101	58	98	57	92	54	90	40	78	38	70	20	83
72	38	72	45	70	32	57	26	58	24	54	3	79
105	59	108	70	96	54	80	40	78	40	76	30	78
96	40	97	48	89	35	74	27	(1)	(1)	56	-5	.....
105	52	110	60	(1)	(1)	88	50	80	38	62	22	.....
96	50	92	54	88	38	78	38	75	26	68	13	83
102	54	96	55	88	46	91	40	82	34	78	18	84
96	64	93	59	79	39	(1)	(1)	60	26	47	9	.....
118	76	120	71	113	62	104	48	90	37	80	30	92
92	40	90	48	75	36	71	31	60	20	42	-18	114
102	60	106	60	96	54	90	46	78	34	70	25	81
86	43	87	48	(1)	(1)	68	28	64	18	56	-7	.....
106	80	107	78	108	70	86	66	79	50	75	39	78
106	64	108	64	100	54	90	46	84	38	72	34	77
106	61	111	55	100	48	81	43	79	35	80	20	91
96	62	100	60	92	44	76	30	68	30	62	Zero.	110
90	46	88	40	82	30	74	26	60	14	50	-14	112
106	72	97	66	94	53	87	40	90	29	70	23	96
109	65	109	64	94	48	85	44	92	34	65	25	84
106	68	100	65	89	58	79	48	76	39	70	25	82
106	70	104	70	84	40	76	22	67	12	57	Zero.	132
96	60	104	60	90	58	(1)	(1)	79	37	71	26	.....
106	64	106	78	(1)	(1)	97	53	87	49	80	43	.....

*Observations discontinued.

APPENDIX 22.

Mean of the maximum and minimum temperatures (in degrees Fahrenheit) at the cotton-region stations of the Signal Service, United States Army, for the months July to October, 1884, and May and June, 1885.

[These means are obtained by dividing the sums of the daily readings of self-registering thermometers by the number of observations taken—one daily at 5 p. m., central time.]

Stations.	1884.								1885.			
	July.		August.		September.		October.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Wilmington, N. C.:	o	o	o	o	o	o	o	o	o	o	o	o
Charlotte, N. C.	86.5	68.5	84.5	66.5	81.9	64.4	76.4	57.8	76.3	58.5	84.3	67.4
Cheraw, S. C.	86.2	67.3	80.0	65.2	86.9	60.0	85.1	53.7	83.3	54.3	89.3	66.4
Florence, S. C.	81.2	60.7	80.5	68.0	86.9	63.1	82.1	56.3	82.6	50.9	89.7	66.1
Goldsbrough, N. C.	86.6	71.5	86.5	68.0	84.7	62.3	80.5	57.1	78.2	53.0	86.1	66.9
Lumberton, N. C.	80.4	60.3	83.8	66.9	83.5	60.3	79.7	54.3	80.8	53.8	86.7	66.1
New-Berne, N. C.	86.5	69.2	85.6	67.1	87.5	64.9	76.6	54.9	79.9	57.8	87.1	65.4
Raleigh, N. C.	86.5	67.9	86.2	66.4	85.1	61.1	78.0	54.4	79.3	54.3	88.3	64.3
Salisbury, N. C.	82.3	63.3	89.5	61.8	89.1	53.4	81.2	49.6	80.9	41.7	90.7	51.6
Wadesborough, N. C.	81.5	63.6	88.9	65.9	86.6	62.2	82.5	55.6	81.7	49.3	90.0	56.2
Weldon, N. C.	88.4	68.1	86.1	67.0	85.1	61.5	77.7	52.2	76.7	53.3	86.6	63.0
Wilmington, N. C.	87.4	73.5	84.6	70.5	83.9	67.5	77.7	60.5	79.0	62.9	84.6	66.0
Charleston, S. C.:												
Branchville, S. C.	80.9	71.9	87.8	69.0	84.9	65.5	80.4	56.9	82.3	60.0	89.2	66.3
Charleston, S. C.	86.9	76.4	85.2	72.7	83.1	71.7	78.0	65.8	79.9	66.4	86.8	72.6
Hardeeville, S. C.	83.7	70.6	89.6	63.7	86.8	65.3	82.4	54.8	84.5	56.7	90.6	66.1
Jacksonborough, S. C.	81.6	73.4	88.6	71.3	86.4	62.8	80.7	53.6	77.4	55.1	83.7	63.5
Kingstree, S. C.	82.1	69.3	89.5	67.3	86.0	62.1	80.6	51.4	82.7	47.3	89.9	64.0
Saint George's, S. C.	86.1	63.8	89.9	66.5	85.8	63.1	81.6	55.1	84.9	55.7	91.4	64.2
Saint Matthew's, S. C.	91.4	71.4	88.5	63.9	85.3	64.9	81.6	56.4	83.2	59.0	90.1	66.1
Yemassee, S. C.	92.0	70.8	89.0	63.4	85.7	64.4	81.1	54.5	83.3	58.4	89.8	67.8
Augusta, Ga.:												
Allendale, S. C.	81.0	63.6	88.8	61.9	85.0	64.8	81.5	60.1	82.9	60.3	89.2	65.5
Athens, Ga.	86.0	69.7	92.2	65.2	87.8	60.1	80.9	50.9	84.6	54.4	94.2	65.6
Augusta, Ga.	89.9	72.9	88.3	70.9	85.3	68.2	81.0	61.2	83.0	61.9	91.9	68.7
Batesburg, S. C.	81.3	70.4	89.7	67.3	86.3	64.7	81.4	58.2	82.8	49.4	81.4	67.2
Blackville, S. C.	82.9	73.6	89.1	68.9	85.5	63.9	81.7	56.8	82.8	58.2	89.6	66.3
Camak, Ga.	84.0	69.6	92.8	66.6	90.7	68.5	85.7	59.0	84.3	58.2	92.0	65.2
Chester, S. C.	82.2	69.6	92.4	66.5	84.3	62.8	83.1	54.1	82.3	56.0	90.3	67.0
Columbia, S. C.	80.4	69.5	89.0	68.0	86.0	64.2	81.2	54.6	80.0	60.2	83.0	66.3
Greenwood, S. C.	86.4	67.9	84.6	64.3	85.0	59.7	80.3	56.9	80.3	57.7	89.0	67.6
Union Point, Ga.									87.5	54.9	85.7	63.3
Washington, Ga.	85.5	69.2	83.4	67.0	83.3	64.3	85.0	57.2	83.5	54.4	91.7	67.8
Waynesborough, Ga.	86.0	71.0	89.2	64.3	85.6	64.3	81.5	46.7	83.8	60.1	91.4	68.3
Savannah, Ga.:												
Altany, Ga.	81.5	73.2	81.1	71.0	90.0	68.0	86.4	59.7	84.3	63.1	91.7	72.4
Allapaha, Ga.	81.7	72.9	86.4	67.1	87.7	66.0	83.2	56.1	80.6	57.9	89.3	67.9
Bainbridge, Ga.	80.3	72.5	90.6	70.2	90.2	67.7	85.5	58.4	83.6	65.1	90.5	70.8
Cedar Keys, Fla.	87.5	76.8	88.1	74.4	86.9	73.6	81.7	67.3	81.7	69.9	87.5	76.5
Eastman, Ga.	82.8	(?)	80.8	(?)	89.7	(?)	84.1	(?)	83.9	59.0	91.9	66.9
Fernandina, Fla.	91.6	71.7	87.9	72.3	(?)	(?)	89.3	73.0	90.1	67.4	88.5	72.0
Fort Gaines, Ga.	91.0	72.2	90.0	63.4	90.8	66.3	86.0	57.4	84.5	59.9	92.4	66.2
Jesup, Ga.	84.5	71.3	91.1	69.7	87.6	66.6	82.4	58.9	85.0	60.5	92.7	66.3
Live Oak, Fla.	84.3	69.7	92.0	67.3	89.9	64.0	85.6	56.6	86.0	60.6	92.0	66.0
Millen, Ga.	84.1	69.2	91.8	68.0	87.9	63.4	84.6	55.7	83.5	58.6	92.1	67.3
Quitman, Ga.	82.6	72.7	91.5	66.4	89.9	66.8	85.5	56.6	86.4	61.3	94.1	66.6
Savannah, Ga.	86.9	76.0	86.2	73.1	83.1	70.4	78.2	63.8	90.9	66.3	86.7	72.8
Smithville, Ga.	84.1	68.0	86.0	67.9	90.3	64.1	85.6	54.1	87.7	61.8	95.1	66.5
Thomasville, Ga.	89.4	72.8	89.0	69.2	88.2	67.4	85.2	59.7	83.3	61.8	90.3	66.2
Waldo, Fla.	86.2	72.7	90.7	70.4	(?)	(?)	85.9	63.8	87.1	58.3	91.6	76.7
Way Cross, Ga.	90.9	70.9	94.5	72.6	90.5	63.2	86.7	64.7	83.5	61.9	91.5	70.4
Atlanta, Ga.:												
Anderson, S. C.	83.8	68.8	91.4	66.7	89.4	63.1	82.5	56.0	83.2	55.2	92.4	65.8
Atlanta, Ga.	85.0	70.6	83.1	67.5	83.6	66.1	77.1	59.5	74.8	56.0	84.0	66.3
Cartersville, Ga.	91.7	67.9	88.9	65.1	88.7	63.7	81.0	54.8	77.1	53.3	89.3	65.7
Columbus, Ga.	89.6	69.2	82.4	70.4	89.6	68.2	84.8	58.5	87.5	60.3	89.0	66.6

† Twenty-two days only.

‡ Thirty days only.

§ Twenty-eight days only.

¶ Twenty-seven days only.

‡ Twenty-six days only.

§ Twenty-nine days only.

¶ No record.

‡ Twenty-five days only.

§ Twenty-three days only.

Mean of the maximum and minimum temperatures at the cotton-region stations of the Signal Service, &c.—Continued.

Stations.	1884.								1885.			
	July.		August.		September.		October.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Atlanta, Ga.—Continued:	o	o	o	o	o	o	o	o	o	o	o	o
Dalton, Ga.	88.7	69.0	87.2	65.0	88.8	68.6	80.1	54.8	80.0	153.6	92.5	65.1
Gainesville, Ga.	82.5	67.2	85.0	65.8	84.7	57.4	77.5	52.2	79.0	153.5	88.4	63.4
Greenville, S. C.	91.7	67.1	87.8	64.9	85.8	61.0	79.6	58.5	81.1	152.5	91.2	64.9
Griffin, Ga.	88.5	70.9	86.1	67.4	86.1	66.4	80.5	59.0	78.5	159.2	86.7	68.8
Macon, Ga.	93.2	71.7	90.0	69.3	89.2	66.2	88.9	58.1	83.3	159.8	91.7	69.6
Newnan, Ga.	91.2	70.6	88.4	68.9	88.6	65.0	82.1	58.1	81.4	158.4	89.9	67.3
Spartanburg, S. C.	92.1	67.4	89.5	65.1	89.0	60.8	83.6	52.8	83.2	150.9	89.6	65.9
Toccoa, Ga.	90.5	68.8	88.0	64.1	86.7	61.0	79.3	52.6	80.5	154.4	89.7	64.2
West Point, Ga.	92.0	71.1	89.5	67.5	89.7	66.0	82.2	56.8	83.3	155.7	89.0	68.1
Montgomery, Ala.:												
Birmingham, Ala.	91.2	68.8	89.9	65.9	88.6	66.2	86.1	67.2	80.4	152.0	90.6	61.7
Calera, Ala.	90.2	68.4	89.2	62.4	90.3	59.3	82.9	48.9	145.6	154.2	105.8	105.0
Enfauila, Ala.	91.1	72.1	89.6	69.6	90.2	71.3	85.2	56.5	100.0	160.1	90.4	69.2
Fort Deposit, Ala.	90.4	70.6	89.3	64.2	88.9	64.1	82.7	56.6	81.3	171.0	89.7	71.2
Greenville, Ala.	(*)	(*)	89.3	63.8	90.5	68.6	83.2	58.2	82.0	74.2	89.5	79.0
Marion, Ala.	85.1	72.9	83.2	67.5	94.0	65.9	84.0	57.0	86.4	156.6	95.8	68.2
Montgomery, Ala.	89.9	72.9	89.8	68.5	89.4	63.6	82.0	61.4	80.3	161.5	90.6	70.4
Opelika, Ala.	92.1	68.7	90.0	64.9	88.0	65.0	82.8	56.8	80.6	158.4	89.2	67.4
Pine Apple, Ala.	88.1	70.0	87.1	68.4	90.1	62.6	83.4	57.7	81.8	157.3	89.0	66.2
Salma, Ala.	88.9	65.3	88.6	67.5	89.0	65.0	81.9	57.4	80.1	158.0	90.6	68.6
Mobile, Ala.:												
Aberdeen, Miss.	88.5	70.7	86.7	68.6	86.7	65.7	79.0	54.8	81.1	158.1	89.9	68.3
Columbus, Miss.	86.4	70.9	83.7	67.2	92.6	63.4	83.3	56.6	84.0	159.2	95.3	71.6
Evergreen, Ala.	88.9	77.0	88.8	73.9	92.4	70.5	85.2	68.4	(*)	(*)	(*)	(*)
Livingston, Ala.	93.9	72.1	91.5	67.3	91.0	68.0	81.0	55.0	85.0	167.7	94.0	77.0
Macon, Miss.	90.6	72.9	92.4	64.2	83.4	64.4	82.9	58.5	83.2	158.5	90.0	68.2
Meridian, Miss.	94.1	71.5	92.5	68.4	92.2	64.4	73.8	54.8	82.5	161.5	93.7	71.1
Mobile, Ala.	89.7	73.7	88.9	71.2	87.5	71.0	82.5	63.6	80.2	164.1	88.2	71.0
Okloma, Miss.	90.7	70.5	93.7	66.7	92.6	65.4	84.4	55.2	84.2	163.3	92.9	78.9
Waynesborough, Miss.	93.6	71.1	92.8	67.4	91.3	65.0	83.7	53.2	83.7	160.1	91.8	69.1
New Orleans, La.:												
Alexandria, La.	95.7	71.8	92.5	68.6	91.0	67.0	81.0	59.0	81.1	162.4	92.2	68.7
Amite City, La.	94.9	72.5	93.6	68.2	91.6	65.2	85.7	58.5	83.8	158.5	91.6	68.2
Brookhaven, Miss.	94.5	72.2	90.9	67.2	90.3	66.8	83.8	58.1	83.4	158.8	94.0	67.5
Cheneyville, La.	95.8	73.1	91.9	67.5	90.8	66.6	81.7	56.7	84.2	161.5	95.2	68.2
Conahatche Chute, La.	97.4	73.9	94.8	69.0	93.0	68.0	79.0	57.0	80.5	159.7	96.3	68.5
Hazlehurst, Miss.	97.5	80.3	93.2	70.4	92.7	65.3	89.4	57.8	89.1	160.4	99.1	68.3
Lafayette, La.	92.5	74.4	91.8	70.2	91.0	70.0	82.9	60.7	82.5	164.6	91.5	70.6
Minden, La.	100.1	72.2	95.2	68.4	93.5	69.2	81.8	56.7	83.9	157.6	94.3	68.3
Natchez, Miss.	92.3	75.2	95.6	70.3	88.9	70.5	80.1	61.2	83.0	161.0	92.8	69.2
Natchitoches, La.	90.5	76.8	90.0	70.6	87.6	70.5	77.9	59.5	80.3	160.5	91.2	69.6
New Orleans, La.	90.8	77.8	88.1	74.4	86.8	73.9	80.3	67.4	80.5	168.4	89.0	76.8
Opelousas, La.	96.6	70.1	88.8	66.7	98.7	67.3	84.0	59.6	84.2	162.6	95.1	69.1
Shreveport, La.	99.1	77.0	94.7	72.1	91.9	71.6	77.5	59.5	83.6	162.3	93.4	72.3
Whiterville, La.	94.5	74.6	91.9	69.1	91.0	68.5	82.3	59.9	82.2	162.3	(*)	(*)
Galveston, Tex.:												
Anatin, Tex.	100.0	74.0	100.9	67.9	94.8	72.3	(*)	(*)	(*)	(*)	95.1	72.2
Beaumont, Tex.	(*)	(*)	94.3	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
Belton, Tex.	98.7	(*)	96.2	(*)	94.2	(*)	(*)	(*)	80.9	57.5	92.9	54.3
Columbia, Tex.	92.8	72.6	91.5	71.0	88.7	70.7	(*)	(*)	82.2	66.4	88.7	72.8
Corralcoba, Tex.	99.3	74.4	96.2	70.1	94.6	71.8	(*)	(*)	83.1	53.7	94.3	62.7
Cuero, Tex.	99.5	74.8	96.4	72.7	93.0	71.0	(*)	(*)	86.5	104.5	97.0	72.0
Dallas, Tex.	100.8	75.7	96.1	71.6	91.0	72.0	80.0	57.0	83.5	(10)	94.1	67.4
Galveston, Tex.	90.6	80.4	89.1	73.7	87.2	79.0	79.7	69.9	81.5	70.6	88.7	79.0
Hearne, Tex.	97.7	73.0	94.5	69.5	91.3	68.3	(*)	(*)	83.2	59.3	98.4	69.7
Hempstead, Tex.	95.1	75.7	91.5	75.2	90.2	79.5	(*)	(*)	(*)	(*)	(*)	(*)
Houston, Tex.	99.7	74.4	95.3	70.8	89.4	70.4	78.2	61.0	82.1	65.1	89.5	71.3
Huntsville, Tex.	97.1	75.1	95.5	71.1	92.6	71.1	(*)	(*)	82.2	61.7	92.7	70.9
Longview, Tex.	99.9	76.7	98.4	68.0	90.6	66.4	(*)	(*)	82.2	(10)	90.3	64.4
Luling, Tex.	(*)	(*)	98.7	74.2	94.1	75.5	83.5	63.5	(*)	(*)	102.2	76.6
Orange, Tex.	100.5	102.2	102.5	100.1	100.2	100.5	105.0	59.0	100.8	100.4	90.8	79.3
Palentine, Tex.	83.9	74.8	91.4	70.3	90.3	70.7	77.0	59.1	70.5	61.3	89.4	70.9
San Antonio, Tex.	92.2	75.0	92.4	73.5	89.4	70.4	78.7	64.0	1461.2	1403.6	91.4	71.1
Sour Lake, Tex.	98.3	77.9	104.3	107.4	101.7	107.3	101.8	108.4	108.4	104.3	100.1	108.7
Tyler, Tex.	97.8	73.7	93.7	69.5	92.5	71.0	(*)	(*)	82.5	58.0	93.6	64.8
Waco, Tex.	100.3	77.0	97.5	73.1	94.0	74.0	(*)	(*)	82.0	61.0	92.6	71.7
Weatherford, Tex.	98.5	77.4	104.8	108.1	102.6	102.8	(*)	(*)	108.8	100.3	108.0	108.0
Wetmar, Tex.	97.9	77.4	92.5	74.4	92.8	76.2	82.4	63.0	83.7	63.1	94.6	71.8

1 Twenty-nine days only.

2 Thirty days only.

3 Twenty-seven days only.

4 Twenty-eight days only.

5 Twenty-five days only.

6 No record.

7 Twenty-four days only.

8 Observations discontinued.

9 Twenty days only.

10 Record incomplete.

11 Seventeen days only.

12 Eighteen days only.

13 Twenty-six days only.

14 Twenty-three days only.

15 Sixteen days only.

Means of the maximum and minimum temperatures at the cotton-region stations of the Signal Service, &c.—Continued.

Stations.	1894.								1895.			
	July.		August.		September.		October.		May.		June.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Vicksburg, Miss.:	o	o	o	o	o	o	o	o	o	o	o	o
Edwards, Miss.	93.9	73.7	91.4	70.2	93.2	68.3	82.4	59.3	83.2	61.2	92.9	71.0
Jackson, Miss.	96.5	72.1	91.1	65.1	92.2	68.7	80.6	57.6	84.2	59.2	94.1	68.4
Lake, Miss.	12.0	69.7	90.0	65.3	89.6	63.7	82.1	52.8	82.3	54.2	92.9	58.8
Monroe, La.	98.0	74.3	90.3	68.4	90.3	68.3	80.5	57.4	80.1	60.9	91.2	70.3
Vicksburg, Miss.	93.7	74.8	90.5	69.8	89.9	70.0	88.8	61.0	81.2	62.5	91.6	74.2
Little Rock, Ark.:												
Arkansas City, Ark.	94.8	73.6	90.1	68.5	87.1	63.7	(*)	(*)	(*)	(*)	(*)	(*)
Brinkley, Ark.	94.1	(1)	82.3	(1)	88.4	(1)	78.6	(1)	81.9	55.5	91.6	66.2
Devall's Bluff, Ark.	91.0	63.8	83.0	64.5	88.6	63.7	78.4	51.4	79.2	52.8	89.5	65.1
Fort Smith, Ark.	96.7	72.1	90.1	68.0	92.2	68.4	79.3	55.0	76.8	56.7	89.3	67.9
Helena, Ark.	91.1	71.5	88.5	67.2	94.2	64.9	74.3	55.3	80.2	57.1	91.6	68.8
Kennett, Ark.	98.4	69.0	89.5	63.7	87.7	63.4	75.0	52.0	73.1	56.7	83.1	67.2
Little Rock, Ark.	93.3	72.9	83.8	66.4	88.5	67.6	75.8	57.5	77.9	60.1	89.0	71.6
Madison, Ark.	97.0	69.0	94.6	64.7	(1)	(1)	75.6	53.4	83.0	53.6	91.5	65.6
Magnolia, Ark.	96.7	74.2	89.0	74.0	92.0	71.2	80.5	62.6	83.8	54.0	93.7	69.2
Malvern, Ark.	98.1	70.8	91.7	67.4	89.2	63.7	82.7	58.2	82.0	51.8	94.4	66.9
Monticello, Ark.	93.7	72.1	91.1	65.4	100.6	100.3	77.6	54.6	79.8	57.0	92.1	66.7
Newport, Ark.	93.9	58.6	89.4	62.6	87.4	62.1	74.4	42.3	80.1	57.4	93.5	67.0
Paris, Tex.	96.2	71.5	83.5	66.6	91.7	67.0	(1)	(1)	80.1	53.0	90.4	64.2
Pine Bluff, Ark.	93.6	75.6	83.8	75.0	89.6	70.2	75.3	45.3	78.9	51.1	90.1	65.9
Prescott, Ark.	97.5	61.2	101.6	58.1	90.5	64.3	77.6	43.7	81.1	49.6	93.4	61.5
Russellville, Ark.	103.6	64.7	91.2	68.4	89.0	68.7	(*)	(*)	75.8	56.6	90.9	67.4
Texarkana, Ark.	95.5	65.2	92.3	61.0	90.7	61.9	78.0	48.0	81.9	45.8	88.9	67.1
Memphis, Tenn.:												
Batesville, Miss.	95.3	71.0	92.4	68.7	91.8	66.4	81.6	54.3	81.0	54.4	83.8	68.3
Bolivar, Tenn.	89.8	70.9	87.8	63.9	88.0	64.9	(*)	(*)	76.6	54.7	87.0	66.9
Brownsville, Tenn.	91.3	70.2	88.5	64.3	87.8	60.1	78.1	53.6	79.2	57.0	89.1	67.6
Corinth, Miss.	92.2	68.3	89.1	65.5	89.6	64.2	80.2	53.5	80.1	54.2	88.2	67.9
Covington, Tenn.	92.9	69.4	89.7	63.6	87.9	63.2	77.6	52.3	79.1	55.7	89.4	67.1
Decatur, Ala.	92.8	68.0	89.5	65.1	89.7	63.3	80.5	55.0	80.4	54.8	91.9	65.7
Dyersburg, Tenn.	93.4	68.2	89.8	62.7	87.9	63.8	76.2	52.2	76.3	55.2	86.3	60.3
Grand Junction, Tenn.	90.3	68.9	89.6	64.1	88.3	64.6	79.0	54.6	77.3	56.4	88.3	67.3
Grenada, Miss.	103.4	170.5	89.7	63.2	90.1	64.3	80.3	53.6	84.5	52.1	93.2	59.3
Hernando, Miss.	95.9	65.8	93.7	62.3	91.3	61.7	80.2	56.0	82.9	56.8	94.0	80.4
Holly Springs, Miss.	90.0	70.5	87.1	67.4	85.0	67.0	77.4	57.1	77.9	59.3	89.1	70.3
Memphis, Tenn.	90.9	73.9	86.9	70.4	86.3	69.2	75.5	58.6	77.6	56.7	89.0	70.7
Milan, Tenn.	92.1	68.3	88.8	68.8	87.6	63.9	77.0	53.2	80.7	55.1	92.1	66.7
Nashville, Tenn.	87.2	70.4	85.8	66.5	84.8	65.3	75.8	56.7	75.1	57.3	84.3	68.5
Oxford, Miss.	92.1	68.7	88.1	61.2	87.4	65.4	78.8	55.4	79.4	56.6	90.7	68.3
Paris, Tenn.	89.9	67.5	87.1	62.6	86.1	62.5	75.5	51.8	73.1	54.9	87.4	57.1
Scottsborough, Ala.	89.3	66.9	87.5	63.3	88.0	61.1	80.1	53.0	77.7	55.8	87.3	63.7
Tusculum, Ala.	90.3	68.2	88.6	64.7	88.9	62.9	81.1	54.7	77.9	54.6	90.1	65.6
Witbe, Tenn.	(*)	(*)	92.9	63.7	92.5	62.0	81.7	53.9	79.9	64.1	89.8	65.3

¹ No record.

² Twenty-seven days only.

³ Thirty days only.

⁴ Twenty-nine days only.

⁵ Twenty-eight days only.

⁶ Record incomplete.

⁷ Twenty-three days only.

⁸ Twenty-six days only.

⁹ Twenty-four days only.

¹⁰ Seventeen days only.

¹¹ Twenty-five days only.

¹² Nineteen days only.



APPENDIX 23.

Mean temperature (in degrees Fahrenheit) at 7 a. m., 3 and 11 p. m. (Washington time), at from January 1, 1880,

Stations.	January.			February.			March.			April.			May.		
	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.
New England:	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Eastport, Me.	16.9	23.0	19.5	20.5	26.6	22.7	25.0	31.5	27.8	35.4	42.1	35.9	45.4	51.9	44.0
Portland, Me.	20.7	29.3	23.7	24.8	33.4	28.0	30.4	38.7	32.8	41.0	50.4	42.6	52.0	60.6	52.7
Mount Washington, N. H.	5.8	6.8	5.7	8.5	9.6	8.1	8.5	11.2	9.0	18.4	22.4	19.5	32.0	36.9	33.6
Boston, Mass.	22.2	30.6	25.4	26.5	35.1	28.5	30.9	38.2	32.5	40.8	48.4	41.6	53.2	59.9	52.8
New Haven, Conn.	23.0	31.0	25.0	27.0	35.2	29.5	31.0	38.9	33.0	41.9	50.9	42.9	54.4	63.3	55.1
New London, Conn.	25.4	32.7	28.0	29.2	36.3	30.9	33.3	39.9	34.3	43.5	54.8	46.2	55.6	66.0	53.4
Middle Atlantic States:															
Albany, N. Y.	22.1	28.5	24.3	27.0	34.0	29.0	31.8	38.8	33.8	44.0	53.3	45.0	57.7	67.4	58.5
New York City.	27.3	33.5	29.3	30.7	37.6	32.4	33.5	41.0	35.0	43.8	52.3	43.8	53.5	63.1	57.3
Philadelphia, Pa.	28.8	34.9	31.5	33.9	41.5	36.1	36.3	44.9	39.9	48.5	58.0	49.8	58.7	70.0	60.0
Atlantic City, N. J.	29.8	35.8	31.6	33.1	39.3	34.8	35.7	44.2	37.3	45.9	55.4	46.6	56.1	67.5	55.8
Barnegat City, N. J.	29.5	35.0	31.1	32.8	38.5	34.0	35.6	43.7	37.4	46.1	55.8	46.5	56.3	67.9	55.0
Cape May, N. J.	32.6	37.3	34.6	36.5	42.1	38.4	38.0	44.3	40.9	49.6	59.2	50.4	60.3	72.0	63.4
Sandy Hook, N. J.	28.6	33.5	30.2	31.9	37.6	32.9	34.8	41.3	36.7	44.9	54.8	46.9	57.9	77.3	67.2
Baltimore, Md.	31.3	38.1	33.9	36.2	44.3	38.6	38.5	47.3	41.8	50.8	60.5	51.3	60.0	72.2	63.1
Washington City.	28.9	36.7	31.5	34.2	44.2	37.0	36.6	44.7	40.4	48.6	58.9	49.7	59.7	77.3	62.0
Cape Henry, Va.	37.9	42.4	39.6	42.5	48.4	44.3	43.7	50.0	45.4	51.2	58.6	52.0	62.2	72.0	62.8
Lynchburg, Va.	33.5	42.6	36.4	38.7	50.3	42.8	40.7	52.9	44.6	50.0	63.4	54.0	63.0	76.0	64.9
Northfolk, Va.	38.1	44.2	39.2	42.7	52.1	45.1	44.0	53.3	46.6	52.4	61.5	53.0	64.3	74.4	64.0
South Atlantic States:															
Charlotte, N. C.	37.2	46.4	41.0	42.5	54.7	47.7	44.8	57.2	49.1	52.9	66.2	57.3	63.8	76.5	66.8
Kitty Hawk, N. C.	40.5	44.4	41.5	44.5	50.0	45.7	45.0	51.2	46.2	51.3	57.7	51.9	62.2	70.0	62.0
Smithville, N. C.	43.9	51.2	46.5	48.1	56.7	51.0	49.7	58.6	53.3	56.8	64.9	58.8	67.0	75.4	68.2
Wilmington, N. C.	44.4	53.9	46.7	48.3	60.4	51.8	50.0	61.3	53.8	57.7	67.6	59.0	68.6	76.7	67.5
Charleston, S. C.	47.8	56.1	50.8	51.7	61.9	55.1	53.3	64.6	57.5	60.9	69.5	62.9	69.9	77.7	70.9
Augusta, Ga.	43.6	55.2	47.7	48.0	63.5	53.3	50.0	65.9	56.1	57.6	67.2	60.2	65.9	81.4	70.0
Savannah, Ga.	48.4	58.7	52.2	52.0	64.2	56.5	54.9	67.7	59.9	62.2	72.2	66.5	70.0	79.0	71.4
Jacksonville, Fla.	52.5	64.0	55.6	55.9	68.5	59.7	58.6	70.1	62.2	64.4	76.7	66.7	73.2	80.7	71.9
Florida Peninsula:															
Cedar Keys, Fla.	54.5	62.4	57.6	58.5	66.9	61.6	60.0	68.9	64.1	67.0	75.3	69.3	77.2	81.2	74.1
Key West, Fla.	69.1	75.5	70.8	70.7	76.8	72.0	71.1	78.8	72.4	75.0	81.6	75.1	78.7	83.7	77.8
Eastern Gulf States:															
Atlanta, Ga.	39.6	48.5	44.2	44.4	55.4	50.1	46.9	59.5	52.7	55.1	67.5	58.0	63.3	75.9	68.1
Pensacola, Fla.	50.1	58.6	53.5	53.7	63.6	57.8	57.0	67.4	61.0	64.1	73.1	66.7	70.0	79.4	72.1
Montgomery, Ala.	44.3	55.1	49.2	48.8	62.1	54.3	51.5	60.0	57.6	61.8	73.7	64.0	68.5	81.3	71.0
Vicksburg, Miss.	44.4	53.9	48.8	49.3	60.8	54.4	53.1	66.1	59.0	62.3	73.6	65.5	69.8	81.1	71.4
New Orleans, La.	52.2	60.4	55.2	56.5	65.5	59.6	59.5	68.9	63.4	66.0	75.0	69.0	72.4	80.2	74.3
Western Gulf States:															
Shreveport, La.	41.7	52.1	46.5	47.1	57.6	51.7	51.9	65.5	58.8	59.4	74.7	65.5	67.1	78.1	72.0
Little Rock, Ark.	37.8	47.5	42.2	43.4	52.6	48.1	48.2	59.8	54.2	56.4	69.6	62.2	64.1	77.1	68.9
Galveston, Tex.	51.0	56.0	51.8	55.7	61.3	58.0	61.0	67.2	63.7	67.2	73.9	69.9	73.5	79.7	75.5
Indianola, Tex.	49.7	57.0	52.4	55.4	61.9	57.5	61.3	68.8	63.9	67.2	75.5	69.8	73.2	80.5	75.5
Rio Grande Valley:															
Brownsville, Tex.	53.7	65.2	56.9	58.4	69.0	61.1	64.3	75.1	67.0	69.7	80.5	72.3	74.8	85.1	76.7
Ohio Valley and Tennessee:															
Chattanooga, Tenn.	37.6	46.2	42.0	43.2	53.2	47.7	45.9	57.5	51.1	54.3	67.3	58.5	62.0	76.6	68.0
Knoxville, Tenn.	34.2	44.2	38.6	39.8	51.7	44.8	44.1	54.9	48.3	51.1	65.5	55.9	60.0	75.5	66.4
Memphis, Tenn.	36.5	45.1	40.7	41.6	51.6	47.1	47.0	56.7	52.8	56.6	68.6	60.1	63.5	77.2	68.1
Nashville, Tenn.	35.2	44.3	39.4	40.9	51.2	45.2	44.4	55.3	48.9	53.0	66.2	58.3	63.1	77.7	68.5
Louisville, Ky.	32.6	39.2	33.1	38.0	46.4	41.8	40.0	50.5	44.4	49.0	60.6	53.5	58.1	73.1	65.3
Indianapolis, Ind.	26.2	33.5	28.7	31.0	39.8	35.7	34.9	45.3	39.9	44.6	55.0	48.1	52.8	67.0	62.5
Cincinnati, Ohio.	31.2	38.9	34.3	36.9	45.8	40.8	39.9	50.9	44.3	49.0	60.0	53.8	58.9	72.2	64.6
Columbus, Ohio.	26.3	32.9	29.5	32.3	39.3	36.0	34.7	43.3	37.9	42.4	55.6	49.3	54.6	70.0	61.5
Pittsburg, Pa.	28.6	34.8	31.6	32.7	40.6	36.0	34.4	43.8	38.0	44.4	55.9	49.8	54.6	72.2	60.7
Lower Lakes:															
Buffalo, N. Y.	22.5	26.0	23.6	24.1	29.3	26.4	28.0	32.0	28.8	37.2	43.7	39.0	50.8	57.3	52.0
Oswego, N. Y.	23.6	28.1	25.4	26.4	31.0	28.8	29.3	33.9	30.1	39.6	44.4	41.6	52.1	58.5	54.2
Erie, Pa.	25.1	29.9	27.0	28.3	33.2	30.8	32.0	38.5	33.4	41.5	46.6	44.2	55.1	61.1	56.2
Cleveland, Ohio.	23.6	28.7	25.2	27.9	33.2	30.8	30.4	35.8	33.4	41.4	47.4	43.6	54.6	62.2	57.4
Toledo, Ohio.	24.2	31.1	28.5	28.6	35.3	32.2	31.9	40.0	35.9	42.7	51.9	46.5	56.3	66.3	58.8
Detroit, Mich.	23.4	28.9	25.0	26.0	34.5	30.6	31.0	38.9	33.9	41.3	47.1	43.4	54.0	63.5	57.2

APPENDIX 23.

stations of the Signal Service, United States Army, for each month of the year. (Computed to December 31, 1884.)

June.			July.			August.			September.			October.			November.			December.		
7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.
34.8	62.1	51.8	59.1	66.0	56.3	59.2	67.0	57.3	54.4	61.1	53.8	44.7	50.4	45.0	24.8	38.8	35.4	24.2	28.4	25.6
61.8	71.1	62.0	66.3	75.9	66.6	65.1	74.9	66.0	58.8	67.9	60.8	47.1	56.6	49.2	36.5	44.3	38.8	27.7	33.6	29.6
42.5	47.7	42.7	44.8	49.9	45.4	45.1	50.4	46.3	41.2	45.1	41.6	29.0	32.1	29.5	16.8	18.2	17.2	10.2	11.5	10.9
63.4	71.5	62.4	67.1	75.6	67.0	65.6	75.6	65.9	60.0	69.4	61.2	48.1	57.1	49.8	36.6	45.3	38.7	28.4	34.9	30.3
64.2	73.5	63.9	68.2	76.8	67.8	66.5	76.2	66.5	60.7	71.7	62.6	48.6	59.7	50.7	37.7	45.7	39.5	27.8	34.9	30.4
64.8	70.2	62.3	66.2	74.7	67.8	67.5	73.9	66.4	62.6	69.9	62.7	51.3	62.8	53.1	39.0	46.7	41.1	30.1	36.5	32.3
67.0	76.6	66.0	70.4	79.2	70.1	67.9	78.7	69.3	61.9	72.4	63.5	48.9	58.9	51.3	37.9	45.2	40.0	28.7	33.4	30.3
64.9	74.1	65.7	69.3	78.2	70.3	67.8	77.4	69.5	63.4	73.5	65.5	52.3	61.7	54.7	39.9	47.5	42.1	31.3	37.0	33.1
67.2	78.4	68.7	70.9	81.7	72.8	70.0	80.0	71.1	64.5	76.4	67.1	53.2	63.9	56.0	40.9	49.0	43.6	32.6	39.1	34.9
65.5	70.7	64.4	67.0	77.3	70.0	69.5	75.5	69.9	66.2	73.1	67.0	55.7	62.7	56.9	41.3	49.2	43.4	33.1	39.4	35.1
65.4	69.7	63.6	67.1	75.5	69.5	70.2	71.0	69.0	66.6	71.4	66.2	55.5	61.3	56.2	41.8	48.8	43.3	33.3	39.1	34.7
66.4	72.4	66.7	71.7	77.9	72.6	70.7	76.7	71.1	67.6	74.0	68.7	58.0	64.3	59.6	43.5	51.6	47.2	36.5	40.9	38.1
66.1	74.1	68.4	70.8	78.8	72.4	69.5	77.7	71.0	65.7	74.1	67.2	55.0	62.3	56.6	42.4	48.6	44.4	33.0	38.0	34.7
69.7	79.0	70.9	73.0	83.5	74.1	70.2	82.5	72.4	65.3	77.2	68.2	54.9	68.0	57.9	42.1	50.8	44.9	34.3	41.6	37.0
68.7	80.4	69.9	71.5	84.7	72.8	69.3	82.6	71.2	64.3	78.8	67.3	53.3	67.2	56.6	39.6	51.0	43.1	31.5	40.0	35.4
70.8	78.7	70.3	74.8	82.8	74.1	73.4	81.2	73.6	70.4	78.7	71.0	61.5	69.0	63.4	49.3	56.1	51.0	40.3	46.3	42.7
71.0	81.8	71.6	73.9	85.6	74.7	71.0	83.7	73.4	65.5	79.6	68.2	55.8	69.5	58.0	44.3	53.9	44.4	34.9	45.3	41.7
73.9	81.1	71.6	76.8	84.7	75.1	74.6	81.9	73.6	69.6	79.2	70.4	60.0	69.2	61.9	47.6	56.3	50.8	39.9	47.9	42.6
72.9	82.3	73.9	74.9	86.0	77.3	71.8	82.6	75.7	65.2	77.3	68.9	55.0	69.2	60.1	43.5	56.3	48.4	37.7	48.7	41.0
71.4	78.3	70.8	76.6	80.7	75.4	74.6	79.8	74.4	71.5	78.5	71.9	63.3	69.2	63.8	51.3	57.2	52.7	42.8	47.9	44.5
74.6	81.5	75.0	78.2	85.1	78.7	75.7	83.1	77.5	71.5	79.2	73.9	62.9	71.6	65.8	49.9	60.3	53.5	44.3	53.1	47.5
74.0	82.5	74.2	77.0	85.2	77.4	74.7	83.7	76.3	70.8	80.4	72.8	62.0	73.7	65.2	49.8	62.4	53.7	43.9	55.7	47.9
77.0	84.5	77.1	79.9	87.6	80.4	77.1	85.5	77.1	73.0	81.8	75.6	65.6	74.7	68.2	53.5	63.3	57.0	48.2	57.6	51.5
73.2	86.8	76.2	79.4	88.9	79.4	73.8	87.4	77.5	69.5	83.8	73.5	61.5	77.1	64.4	47.9	67.3	52.3	43.5	57.2	47.8
77.3	86.0	77.7	80.5	88.6	80.6	77.3	85.8	78.5	72.5	82.2	75.1	64.8	75.5	68.3	52.8	65.1	57.2	48.7	60.2	52.7
78.7	85.6	77.7	80.6	88.4	79.5	73.8	86.3	78.3	73.6	83.7	75.7	68.9	78.3	70.6	57.4	68.8	60.9	52.4	64.4	56.0
74.3	84.9	78.8	80.7	86.5	80.9	73.8	86.9	78.7	75.4	85.1	78.3	70.1	79.4	72.8	60.1	69.5	63.1	55.2	73.3	58.2
82.4	87.6	80.9	83.7	89.4	82.8	83.3	88.1	82.1	80.6	86.8	81.1	77.7	82.4	78.3	70.8	78.5	74.7	69.2	84.4	70.6
71.0	81.3	73.8	73.5	85.0	77.1	70.7	82.4	74.4	66.0	79.0	71.2	58.9	72.1	64.2	45.4	57.5	50.6	40.1	50.8	44.5
77.1	84.2	77.9	78.2	85.6	79.3	76.5	85.4	78.9	72.7	83.1	76.0	67.1	77.8	70.6	54.0	63.6	57.7	50.6	59.9	54.0
73.8	86.8	76.8	75.9	89.0	79.1	73.8	87.4	77.7	68.6	85.0	74.4	62.6	78.2	68.3	48.1	62.6	53.4	44.6	56.3	49.1
74.0	88.2	77.4	75.5	89.7	78.7	73.4	89.4	77.7	68.2	84.4	73.5	62.5	77.2	67.1	48.8	61.3	52.8	45.7	56.9	50.5
78.4	85.1	79.8	80.1	87.1	81.8	78.7	86.8	80.9	75.1	83.7	77.9	69.6	78.0	72.1	57.0	65.4	59.8	53.5	61.5	56.1
74.1	89.4	79.2	78.3	91.9	81.0	73.9	91.0	79.8	68.4	84.7	74.1	61.5	77.1	66.6	47.1	60.0	52.7	43.8	55.2	48.4
72.0	84.9	76.8	74.1	86.9	79.3	73.8	86.2	77.5	65.9	80.8	71.5	59.4	72.2	64.4	45.1	56.6	49.8	40.0	49.9	44.4
79.8	86.2	81.2	81.2	87.9	82.9	80.0	86.9	82.6	75.8	83.1	79.7	72.2	77.5	74.3	58.6	63.8	61.1	55.1	60.1	57.3
78.5	86.9	80.0	79.7	88.4	81.4	78.7	87.2	81.0	76.1	83.1	78.9	71.2	78.4	74.1	58.5	64.8	61.0	53.7	60.7	56.0
78.2	83.6	81.0	78.8	89.9	81.6	76.7	89.6	80.3	74.3	86.2	77.7	71.1	81.7	73.8	59.9	70.4	63.1	56.6	66.8	59.2
70.0	82.6	72.4	72.1	85.5	75.0	70.3	83.6	73.9	64.5	79.5	69.2	57.6	71.7	62.0	43.8	56.0	48.0	38.3	47.6	41.4
67.7	81.0	71.0	69.8	82.8	72.8	68.0	83.3	71.8	62.9	79.8	67.9	54.9	72.4	69.9	40.1	54.6	45.0	34.1	45.3	37.5
72.2	83.8	74.9	74.4	85.7	77.4	73.4	86.4	76.9	66.4	80.1	71.4	59.7	71.8	64.1	44.3	55.2	48.8	38.9	47.6	43.2
71.4	83.5	73.8	72.6	85.7	76.2	71.2	85.3	75.7	64.7	79.6	70.0	58.0	71.6	62.6	42.0	54.5	47.2	37.0	45.9	40.3
69.4	80.3	72.0	72.2	84.0	75.3	69.5	84.0	74.6	63.8	78.6	68.8	55.7	67.6	59.5	41.6	51.2	45.2	35.6	41.4	37.9
68.2	79.8	70.7	70.6	81.9	73.6	67.9	81.8	72.5	61.1	75.5	66.2	51.6	63.5	55.6	38.2	46.0	40.1	28.9	35.2	31.3
69.0	79.8	72.0	71.6	83.4	73.1	69.5	82.8	74.7	64.4	77.3	69.5	55.2	66.2	59.1	40.4	50.1	43.8	33.7	40.7	36.1
66.0	77.3	69.2	68.4	81.4	72.5	66.0	80.4	71.1	60.8	75.7	65.8	51.0	63.1	55.2	36.2	45.9	40.2	29.9	35.5	32.0
65.0	78.8	68.0	66.6	81.7	70.0	64.5	81.9	69.9	60.8	77.3	65.5	51.0	64.6	54.6	38.4	47.6	41.1	31.6	37.6	33.0
61.1	67.8	62.3	65.4	71.7	67.1	64.7	73.7	67.0	60.3	69.1	62.3	48.5	55.9	50.0	38.5	41.5	37.5	28.9	31.8	29.5
61.5	67.6	62.0	65.5	71.9	67.6	65.4	72.9	67.4	60.1	68.0	62.4	48.3	55.6	50.4	37.1	42.0	38.7	28.5	32.0	27.9
64.7	70.4	64.3	68.4	73.8	68.6	67.0	74.2	67.9	61.9	69.4	63.4	51.4	58.7	53.3	38.4	43.7	39.8	30.8	34.4	31.9
63.9	71.1	65.7	67.2	74.9	69.1	65.1	74.8	68.3	61.1	70.7	63.7	50.2	59.2	53.3	36.2	42.9	38.1	28.5	32.4	29.3
60.0	74.3	67.7	69.0	79.0	71.1	66.6	77.0	70.2	61.2	72.4	65.0	50.5	60.0	54.0	37.1	44.8	39.7	29.4	34.2	31.0
68.4	73.8	68.3	68.9	78.1	69.6	65.0	76.6	69.3	60.3	71.4	63.8	50.3	59.0	53.5	37.6	44.6	39.5	29.6	33.9	31.0

Mean temperature (in degrees Fahrenheit) at 7 a. m. 3 and 11 p. m.

Stations.	January.			February.			March.			April.			May.		
	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.
Upper Lakes:	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Alpena, Mich.	14.6	22.7	16.6	15.3	24.6	18.9	19.2	29.2	23.9	32.9	40.8	34.6	16.9	53.5	47.3
Escanaba, Mich.	9.8	18.9	13.3	11.0	22.0	15.9	16.8	29.4	21.9	31.5	41.6	34.0	16.7	55.7	47.9
Grand Haven, Mich.	23.3	27.7	24.7	24.8	31.0	28.0	28.5	35.2	31.7	39.9	47.1	42.8	33.5	56.9	54.7
Marquette, Mich.	12.7	20.4	15.5	13.7	22.4	16.9	19.4	28.2	23.0	33.6	40.6	35.5	24.7	53.2	47.6
Port Huron, Mich.	18.6	25.3	20.6	22.3	30.3	25.1	25.8	32.4	28.7	37.7	43.9	38.6	50.5	58.7	50.8
Chicago, Ill.	22.1	27.9	24.0	25.3	33.4	29.6	31.2	38.2	35.0	44.1	48.6	45.1	54.6	60.9	56.0
Milwaukee, Wis.	17.3	23.4	20.5	22.0	29.0	26.3	27.7	34.1	31.7	38.8	44.5	42.6	51.5	57.4	53.7
Duluth, Minn.	5.4	14.4	10.1	9.8	20.2	15.7	18.4	29.5	24.7	33.6	42.0	37.7	45.5	52.4	47.6
Upper Mississippi Valley:															
Saint Paul, Minn.	8.2	16.8	12.3	13.0	23.9	18.2	23.1	34.2	28.5	38.2	46.1	44.8	51.5	63.3	57.5
La Crosse, Wis.	11.8	20.4	15.7	17.1	27.5	22.6	25.7	35.6	31.7	40.9	48.2	47.4	55.1	63.4	60.6
Davenport, Iowa.	18.8	26.9	23.1	23.8	33.8	29.1	30.3	40.5	35.5	43.3	51.9	49.9	58.4	68.5	61.1
Des Moines, Iowa.	15.6	24.9	20.5	20.4	31.3	25.7	28.8	40.1	33.8	41.1	48.3	44.8	53.4	63.5	59.0
Iubukuk, Iowa.	13.8	23.9	19.4	19.0	30.9	25.3	27.2	38.8	33.3	41.0	48.5	47.5	54.4	64.7	59.8
Krookuk, Iowa.	20.7	28.6	24.2	25.8	35.5	30.6	32.2	43.4	37.1	45.5	53.8	51.1	58.7	70.0	64.2
Chicago, Ill.	32.3	39.8	35.8	38.9	46.1	42.4	42.8	52.2	47.9	53.8	60.4	58.7	63.2	74.4	67.0
Springfield, Ill.	25.1	31.2	27.0	30.2	38.2	33.7	35.3	45.1	39.6	47.1	55.9	52.5	57.9	69.0	63.6
Saint Louis, Mo.	26.5	32.3	28.4	31.9	40.4	35.8	36.7	47.6	42.0	48.6	56.1	54.4	58.9	72.5	66.3
Missouri Valley:															
Leavenworth, Kans.	22.0	31.8	27.0	26.3	38.0	32.1	34.5	47.8	40.7	46.7	56.1	53.3	58.9	71.1	63.7
Omaha, Neb.	15.5	25.5	20.7	19.9	30.4	25.4	28.9	40.8	34.5	43.0	50.6	48.9	55.6	68.0	61.7
Yankton, Dak.	10.2	22.4	15.0	13.1	24.4	18.8	23.5	35.9	29.0	38.0	45.2	44.4	53.3	67.6	61.1
Extreme Northwest:															
Bismarck, Dak.	0.9	10.7	4.4	5.4	17.5	9.8	15.4	27.5	20.7	31.6	40.3	37.4	47.5	64.2	53.8
Buford, Fort, Dak.	0.8	11.3	3.3	3.8	17.4	9.3	15.8	29.6	20.8	30.8	40.8	37.9	44.4	76.3	54.3
Northern Slope:															
Benton, Fort, Mont.	11.9	21.3	14.7	13.1	26.0	19.1	25.6	42.8	31.8	33.2	52.2	40.9	42.7	64.3	52.6
Cheyenne, Wyo.	20.1	32.1	22.7	19.3	33.3	23.2	25.5	42.3	30.5	31.3	49.9	53.8	64.0	80.9	64.0
North Platte, Nebr.	13.9	23.8	18.3	15.8	32.9	22.7	27.0	45.1	34.6	37.7	56.3	46.3	35.0	63.6	52.7
Middle Slope:															
Denver, Colo.	23.4	38.0	29.5	23.3	37.2	28.9	30.9	48.0	39.8	37.9	55.8	47.8	46.7	73.3	65.7
Pike's Peak, Colo.	0.5	4.6	1.3	0.7	6.5	3.0	3.7	11.4	6.4	8.9	17.7	12.3	17.7	28.6	22.1
Dodge City, Kans.	19.9	36.2	26.2	22.4	40.3	29.7	32.6	52.1	40.7	42.0	63.5	55.1	53.2	71.3	60.1
Elliott, Fort, Tex.	23.7	41.8	29.8	26.6	45.8	34.1	36.4	56.8	44.2	44.4	67.4	54.9	54.4	72.6	62.7
Southern Slope:															
Concho, Fort, Tex.	35.2	52.6	40.7	40.3	58.1	46.7	47.8	68.5	54.9	53.3	77.0	61.5	62.1	82.8	69.8
Stockton, Fort, Tex.	34.3	54.7	40.3	39.0	60.0	46.6	45.2	68.8	54.4	50.3	76.3	61.0	63.7	83.9	69.9
Southern Plateau:															
El Paso, Tex.	34.1	53.1	42.9	39.3	56.8	48.7	44.9	65.9	55.3	51.8	74.8	62.3	59.3	84.1	71.2
Apache, Fort, Ariz.	23.1	45.9	32.5	26.7	48.7	36.7	31.6	56.2	42.8	34.4	64.3	49.0	40.4	72.8	56.8
Grant, Fort, Ariz.	34.1	49.8	42.5	37.7	51.6	43.6	41.9	58.3	49.8	47.2	66.6	57.0	55.5	76.1	63.5
Prescott, Ariz.	25.4	45.1	32.0	26.4	45.9	35.6	32.2	52.7	42.7	37.7	60.0	49.7	43.5	69.3	58.3
Middle Plateau:															
Salt Lake City, Utah	24.5	32.1	27.2	25.4	34.8	28.9	34.5	46.1	39.3	42.0	54.2	47.8	50.0	64.4	58.9
Northern Plateau:															
Lewiston, Idaho.	29.0	34.0	31.8	26.4	34.2	30.8	37.1	48.3	34.4	33.0	57.3	52.2	48.9	69.0	60.9
Dayton, Wash.	28.2	35.2	29.3	24.0	35.8	27.5	35.2	50.9	41.0	40.5	58.2	47.9	45.7	67.0	55.0
North Pacific Coast:															
Olympia, Wash.	35.9	39.5	38.0	33.9	39.4	37.4	38.1	47.1	44.7	41.6	52.7	49.7	44.1	59.0	53.9
Portland, Oreg.	37.3	41.8	39.4	34.8	40.9	38.3	40.7	50.2	47.0	45.0	56.4	52.0	48.4	62.8	58.5
Middle Pacific Coast:															
Sacramento, Cal.	40.7	48.8	46.3	42.4	51.7	49.1	47.4	58.5	54.4	50.5	62.2	57.6	55.5	70.1	64.7
San Francisco, Cal.	46.8	51.1	49.9	46.8	52.2	50.3	49.4	55.8	52.5	50.6	57.9	53.1	53.0	62.0	56.0
South Pacific Coast:															
Los Angeles, Cal.	44.9	60.4	50.6	46.1	61.6	51.7	47.8	63.0	53.4	50.6	66.7	55.6	63.9	77.2	68.4
San Diego, Cal.	47.0	60.0	51.4	48.1	59.9	52.6	50.4	60.6	54.2	53.2	63.3	56.9	57.1	69.0	60.4
Alaska Stations:															
Saint Michael's, Fort, Alaska.	3.5	6.2	6.2	0.3	1.8	3.3	8.1	11.1	11.3	16.0	20.4	22.9	23.8	34.4	29.2

(Washington time) at stations of the Signal Service, &c.—Continued.

June.			July.			August.			September.			October.			November.			December.		
7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.
57.0	63.2	56.8	61.1	69.8	61.8	68.0	68.2	64.2	54.2	63.9	56.0	42.6	51.7	44.5	29.9	35.5	31.0	22.2	26.7	23.1
57.4	63.7	56.8	61.2	71.5	63.2	69.0	68.6	62.6	53.8	63.8	56.9	42.8	50.7	45.5	27.8	34.3	30.2	19.3	24.8	21.2
62.0	68.2	62.5	66.6	71.8	66.6	64.0	72.2	68.7	58.7	67.6	61.1	44.8	55.9	50.9	36.2	40.8	37.8	23.8	31.5	23.6
56.8	62.0	55.6	61.8	68.3	61.1	66.0	67.9	60.7	53.7	62.2	54.7	43.2	50.2	44.4	28.3	34.2	30.2	21.0	25.8	22.4
60.3	63.0	60.1	63.9	72.6	64.6	63.2	73.1	65.4	58.1	68.6	60.2	46.6	55.2	48.6	32.8	39.2	33.9	24.8	30.5	26.1
62.5	68.9	64.0	67.4	75.2	69.8	67.4	75.5	70.6	60.9	70.1	64.0	50.4	58.5	53.9	35.3	42.6	38.5	26.1	31.8	23.9
59.4	65.6	61.4	64.2	72.4	66.6	64.2	72.5	67.4	57.7	66.1	61.1	47.7	55.5	51.3	32.1	38.6	35.5	23.0	27.8	23.6
55.6	62.3	56.8	61.9	70.3	63.3	60.9	68.3	63.2	52.0	61.2	55.4	42.1	49.8	45.2	24.7	31.9	27.5	12.4	26.4	15.9
61.2	73.9	65.9	63.6	77.3	68.8	63.0	77.1	68.6	53.6	67.4	58.7	43.7	54.5	47.5	26.1	35.5	29.6	15.3	22.8	18.2
64.1	74.6	68.7	68.1	77.4	70.9	65.0	77.0	70.3	56.8	69.0	62.2	46.5	58.4	51.4	29.7	38.3	33.9	18.9	25.9	22.4
64.8	75.8	68.9	67.9	80.3	72.7	66.6	79.9	71.7	59.3	72.9	64.2	49.4	60.4	53.7	34.4	43.9	38.4	25.5	32.4	28.8
63.5	76.7	68.3	66.2	80.7	71.2	64.7	80.8	70.4	56.9	72.6	62.1	46.8	60.0	51.2	31.8	41.7	34.8	21.5	29.2	24.0
62.7	75.2	67.4	65.9	79.6	70.7	64.4	79.1	69.7	56.6	71.4	61.8	46.6	58.5	51.2	30.6	40.8	35.1	21.4	28.6	24.7
67.1	78.4	69.9	67.0	83.1	74.3	68.1	82.9	73.0	60.4	76.2	66.0	50.0	62.4	54.3	34.8	44.8	38.5	25.8	32.8	28.5
72.0	81.6	74.1	74.5	84.4	76.8	71.9	84.2	75.7	64.9	78.0	69.1	56.8	68.9	60.9	41.6	51.8	45.9	35.2	42.9	38.1
66.6	77.6	70.2	69.9	82.1	73.8	67.4	81.9	72.5	60.2	75.3	65.7	51.4	62.9	55.6	37.1	46.4	40.5	29.1	35.1	31.5
67.7	80.3	71.8	71.1	84.3	75.6	69.4	84.1	74.9	63.0	78.3	69.1	53.4	65.5	58.1	38.9	48.6	42.7	31.5	38.0	34.1
67.5	80.3	72.7	70.0	83.6	75.9	68.3	83.0	74.3	60.3	76.8	66.5	50.0	64.1	55.1	35.2	47.0	39.2	26.9	36.2	30.8
64.4	78.8	71.0	69.8	82.1	74.6	67.2	81.5	73.0	56.2	73.0	64.3	47.7	60.2	52.6	30.8	42.4	35.7	21.1	29.4	24.4
63.6	77.2	68.3	66.0	80.0	71.1	64.7	81.3	70.9	53.7	72.0	59.6	42.9	57.6	48.1	25.8	40.1	30.1	16.0	26.3	19.0
58.8	73.8	63.6	60.9	76.7	66.4	58.7	77.6	66.9	47.1	66.0	54.4	36.3	51.7	41.2	20.0	32.0	24.1	8.7	17.5	10.7
55.8	74.1	63.0	57.7	76.9	64.8	55.7	77.6	65.6	43.9	65.7	51.8	34.1	50.2	40.0	19.1	31.0	22.7	6.0	16.6	8.3
53.5	73.2	62.9	58.6	79.6	68.2	57.5	79.4	68.6	45.6	65.5	55.2	34.2	50.2	41.0	23.8	37.8	28.9	14.5	26.0	19.3
50.5	72.5	59.2	54.6	78.7	64.0	53.4	77.1	62.5	44.7	63.8	58.2	35.8	54.1	40.8	27.1	40.7	28.9	12.6	23.1	12.5
61.0	77.7	67.8	64.6	81.6	71.3	62.7	81.9	70.5	52.4	73.1	60.5	41.4	59.4	48.1	24.6	45.1	31.1	18.6	35.7	22.2
56.9	76.7	67.3	62.2	82.6	72.2	60.9	80.1	70.5	51.2	72.6	62.1	41.4	59.2	49.8	28.5	45.3	34.4	26.9	39.6	30.5
29.6	38.3	32.5	35.8	45.3	33.1	34.3	43.2	36.8	26.5	36.3	29.4	17.7	24.7	19.2	7.4	12.6	8.8	6.0	9.5	6.1
64.6	83.5	71.7	70.7	86.0	74.6	65.5	84.0	72.4	57.8	78.3	64.9	46.8	64.6	52.4	29.0	48.1	35.4	22.9	38.6	27.8
63.7	83.0	72.9	68.5	85.5	75.9	64.8	84.0	73.2	58.6	79.0	68.2	49.2	67.4	55.6	32.8	52.0	38.2	23.6	43.5	31.2
70.5	92.0	77.3	72.7	93.0	79.4	70.1	90.2	77.0	64.3	83.1	71.8	57.4	74.6	62.3	43.2	59.7	47.9	37.9	55.1	42.9
68.4	91.3	77.7	70.3	90.5	79.3	67.4	87.3	75.7	62.0	81.3	69.2	54.4	73.9	61.4	41.3	60.0	47.1	37.3	57.0	42.7
68.7	93.8	79.9	71.7	93.2	80.4	68.9	88.5	76.6	61.2	82.6	69.9	51.3	74.4	60.5	38.8	60.4	48.0	35.8	55.4	43.9
68.9	94.7	80.4	75.3	95.2	81.2	68.2	89.9	77.6	60.9	83.7	67.9	50.6	75.9	63.7	31.0	65.6	37.7	26.3	49.3	34.6
68.5	95.8	80.6	75.8	95.5	81.7	68.4	91.0	77.9	62.1	83.1	69.7	52.8	76.9	64.0	41.4	66.0	48.8	36.8	53.5	44.6
51.1	80.1	68.0	60.1	82.3	71.8	59.5	79.2	63.7	49.7	75.3	61.3	40.1	64.7	50.3	28.6	54.6	34.6	29.1	48.8	35.9
59.6	77.9	68.1	65.7	83.3	74.3	66.0	82.8	73.7	55.6	71.8	62.3	44.1	56.6	48.0	31.3	42.2	34.7	31.1	38.4	33.4
56.7	74.0	69.9	61.6	79.7	70.9	60.0	79.1	78.9	51.1	66.5	61.5	43.0	54.4	49.5	34.2	42.4	38.0	29.4	34.3	31.6
52.0	74.2	62.8	55.0	80.0	67.1	54.4	80.5	65.3	48.3	70.1	56.1	41.0	56.8	46.6	33.5	43.0	35.9	27.8	34.5	29.5
49.4	64.0	61.9	51.4	66.9	65.1	53.6	66.6	64.2	49.2	60.8	56.0	45.4	52.6	48.6	41.2	46.0	43.0	37.4	41.4	39.9
54.1	67.3	63.7	54.3	70.3	67.9	58.0	70.1	63.5	52.3	64.8	59.8	46.8	55.0	51.0	41.4	47.9	44.3	38.2	42.5	40.3
58.5	76.3	68.8	61.3	81.4	73.1	60.2	80.3	71.8	58.8	76.7	68.3	51.4	66.1	59.7	44.1	57.2	52.2	43.6	50.6	48.1
54.3	62.5	54.8	55.1	63.7	57.4	54.8	62.8	56.7	53.3	64.4	57.8	53.9	61.5	56.8	51.0	57.0	54.4	49.5	53.3	52.1
57.5	76.7	62.4	56.7	80.8	64.0	60.5	82.3	65.9	58.3	80.1	64.1	53.5	72.5	59.5	49.1	69.0	55.5	48.2	63.7	53.3
60.5	80.7	63.2	63.1	72.1	65.4	64.7	73.8	67.1	61.7	72.0	65.1	56.8	67.8	60.1	51.4	65.6	55.3	50.9	62.7	54.2
42.1	47.3	42.1	50.6	54.6	55.9	50.1	53.1	54.3	41.3	45.3	45.1	38.3	31.6	31.0	14.8	17.5	16.7	3.5	6.1	5.6

APPENDIX 24.

Mean a. m., p. m., and midnight temperatures, in degrees Fahrenheit, at stations of the commencement of observations

[Observations prior to August 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); November 1, 1874, to December 31, 1884, at

Stations.	January.			February.			March.			April.			May.		
	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
New England:															
Eastport, Me.	17.0	22.4	18.2	20.1	25.9	22.0	26.0	31.6	28.0	36.1	41.5	38.0	46.4	51.5	44.1
Portland, Me.	19.8	27.8	22.5	22.3	30.8	25.7	29.4	37.3	31.5	40.6	48.3	41.2	52.6	59.8	52.6
Mt. Wash'ton, N. H. .	4.5	6.2	5.2	6.2	7.8	6.2	9.4	12.0	10.1	11.9	22.2	20.0	31.6	39.4	32.7
Boston, Mass.	28.2	30.2	25.3	24.9	32.9	27.1	31.5	38.4	32.4	41.7	48.5	41.5	55.5	62.1	53.7
Block Island, R. I. .	28.1	32.2	30.0	31.4	35.7	32.8	33.7	38.8	35.5	44.0	48.4	41.3	50.6	55.5	50.0
New Haven, Conn.	24.1	31.6	28.9	26.4	34.2	29.0	32.5	40.0	33.7	43.4	50.5	43.0	56.3	63.5	54.5
New London, Conn. .	25.4	31.9	28.0	27.0	33.6	29.0	33.3	39.0	34.0	43.9	48.9	42.5	56.0	62.0	53.0
Middle Atlantic States:															
Albany, N. Y.	20.2	26.6	22.7	22.6	29.9	25.1	29.8	36.8	31.8	42.2	50.5	42.9	56.2	63.5	56.9
New York City.	27.1	33.1	29.3	28.6	35.4	30.9	33.7	41.1	35.8	43.8	52.0	45.2	55.9	64.4	56.9
Philadelphia, Pa.	28.8	34.8	30.8	30.7	38.5	33.3	33.8	44.5	38.7	45.7	55.9	47.7	57.8	69.9	59.3
Atlantic City, N. J. .	29.3	35.3	31.2	31.5	37.6	33.1	36.1	42.3	37.2	44.7	54.9	44.4	56.8	69.0	58.4
Barnegat City, N. J. .	29.1	34.2	30.4	31.0	36.5	32.0	36.0	41.4	36.6	44.8	54.8	43.5	57.7	69.4	54.3
Cape May, N. J.	31.8	36.3	33.9	33.4	39.0	35.5	37.9	42.9	39.6	45.9	55.1	47.2	59.8	72.2	57.2
Sandy Hook, N. J. .	28.5	33.1	30.2	29.9	35.7	31.4	34.8	40.9	36.5	43.6	53.0	44.4	56.0	68.3	56.4
Del. B'kwater, Del. .	32.3	37.0	34.4	34.0	42.1	37.3	37.8	43.5	39.8	45.8	55.1	47.1	57.6	69.3	58.1
Baltimore, Md.	31.3	37.9	34.0	33.7	42.1	36.8	38.4	47.0	41.6	48.7	58.7	51.3	60.4	71.1	63.2
Washington City. .	29.4	37.5	32.0	32.1	42.3	34.9	37.2	48.2	40.0	47.7	59.0	50.9	62.9	75.2	61.2
Cape Henry, Va.	34.4	42.8	40.0	41.0	46.2	42.2	44.8	56.1	46.1	52.7	63.5	49.2	62.6	74.8	61.9
Chincoteague, Va. .	31.5	35.9	33.0	33.8	42.7	38.1	38.9	45.2	40.4	48.9	59.2	47.8	58.4	69.3	58.2
Lynchburg, Va.	32.8	42.5	35.6	35.8	47.6	39.3	39.5	53.2	44.8	56.5	63.3	53.7	62.3	74.4	63.2
Norfolk, Va.	33.7	44.0	39.4	39.8	48.3	42.1	44.4	53.3	46.8	53.1	61.9	53.6	64.3	77.2	64.6
South Atlantic States:															
Charlotte, N. C.	37.0	46.5	40.8	41.3	53.4	46.3	45.8	58.2	49.8	53.2	66.1	57.0	68.4	80.7	68.6
Hatteras, N. C.	42.3	44.7	42.6	47.0	51.5	47.7	47.6	53.2	49.8	53.5	65.8	53.5	64.4	76.0	62.6
Kitty Hawk, N. C. .	39.9	44.3	41.1	42.1	47.0	43.7	45.6	52.0	46.5	52.0	67.9	52.4	62.0	74.3	61.3
Macon, Ga.	41.5	47.3	42.7	46.3	54.6	48.4	47.9	55.5	50.6	55.7	68.5	58.6	68.6	80.7	67.4
Smithville, N. C.	43.5	51.0	46.2	46.1	55.0	49.4	50.4	58.2	53.8	55.7	68.5	58.6	68.6	80.7	67.4
Wilmington, N. C. .	42.5	52.6	45.4	45.1	56.2	49.4	50.3	58.0	53.8	55.7	68.5	58.6	68.6	80.7	67.4
Charleston, S. C.	45.5	53.6	48.9	48.9	58.0	52.3	53.6	63.3	57.0	60.8	73.8	63.3	73.8	86.8	73.8
Augusta, Ga.	41.7	54.6	46.1	44.6	59.4	49.6	49.2	56.4	50.8	57.7	72.4	61.3	67.7	79.8	67.4
Savannah, Ga.	46.6	57.6	50.8	49.4	60.8	53.8	54.6	66.0	58.8	62.7	76.4	61.3	71.7	83.8	71.7
Jacksonville, Fla. .	50.4	62.4	53.8	53.1	65.5	56.8	57.8	70.2	60.0	63.5	77.5	65.8	77.3	90.8	77.3
Florida Peninsula:															
Cedar Keys, Fla.	54.5	62.4	57.6	58.5	68.9	61.6	60.4	68.9	64.1	67.0	80.7	68.9	72.4	84.8	72.4
Key West, Fla.	67.7	73.5	69.2	69.5	75.5	70.8	71.3	77.5	72.7	75.5	89.0	77.5	78.7	90.8	77.8
Sanford, Fla.	50.0	69.8	62.1	59.9	73.9	69.5	63.0	73.8	66.5	69.6	83.0	67.7	72.4	84.8	72.4
Eastern Gulf States:															
Atlanta, Ga.	39.6	48.6	44.0	43.5	54.4	48.9	47.5	60.2	53.4	54.8	67.2	56.0	63.3	75.6	63.2
Pensacola, Fla.	50.1	58.6	53.5	53.7	63.6	59.8	57.0	67.7	61.0	64.1	77.3	66.7	70.0	82.3	70.0
Mobile, Ala.	45.8	56.3	49.7	49.8	61.5	54.0	54.7	64.6	58.0	60.2	73.9	63.5	69.9	82.1	72.2
Montgomery, Ala. .	43.8	54.8	48.3	48.8	60.1	52.3	51.0	65.5	57.9	59.8	73.2	63.0	67.7	80.1	67.1
Vicksburg, Miss.	42.8	53.2	47.6	46.7	59.6	52.8	52.6	66.5	58.8	59.9	73.2	64.3	67.7	80.1	67.1
New Orleans, La.	50.0	59.0	53.4	54.1	64.0	57.4	58.7	68.2	63.5	65.0	78.7	68.1	72.6	84.9	72.4
Western Gulf States:															
Shreveport, La.	40.6	51.8	45.4	45.3	58.1	51.4	51.8	66.5	58.4	58.8	73.5	64.4	67.6	80.1	67.6
Fort Smith, Ark.	28.6	38.0	31.0	35.6	46.0	41.0	42.9	59.0	50.2	55.1	67.7	58.8	62.4	74.7	62.0
Little Rock, Ark. .	37.8	47.5	42.2	43.4	52.6	48.1	48.2	59.9	50.4	55.0	69.0	60.2	64.1	77.1	64.0
Galveston, Tex.	49.9	55.4	52.7	54.5	60.6	57.0	61.1	67.2	63.3	66.6	80.3	73.4	80.6	92.7	80.3
Indianola, Tex.	49.2	56.9	52.3	54.8	62.1	56.4	61.7	69.4	64.2	66.6	80.3	73.4	80.6	92.7	80.3
Palestine, Tex.	36.2	47.6	42.3	40.1	55.6	50.4	53.7	67.3	61.3	65.8	79.1	65.5	66.4	78.7	66.4
Rio Grande Valley:															
Brownsville, Tex. .	53.6	65.3	57.0	57.9	69.4	60.6	64.2	75.6	67.7	69.0	83.0	72.4	75.4	88.5	77.1
Rio Grande City, Tex.	50.9	65.2	57.4	56.3	72.6	62.3	62.8	80.0	70.8	77.7	91.8	77.4	77.3	90.1	77.3
Ohio Valley and Tennessee:															
Chattanooga, Tenn. .	38.0	46.8	42.3	41.5	52.1	46.2	45.9	58.3	51.8	53.7	67.1	58.2	62.5	75.6	63.3
Knoxville, Tenn.	33.0	43.0	36.5	37.0	48.8	41.7	41.0	55.5	47.9	50.5	63.5	55.0	60.0	73.1	60.0
Memphis, Tenn.	33.5	44.0	40.0	39.8	50.2	45.3	46.5	57.7	50.8	55.7	68.7	59.9	63.3	76.4	63.3
Nashville, Tenn.	24.6	33.7	28.4	28.5	39.3	32.1	34.4	45.4	38.4	43.4	56.4	47.5	51.1	64.2	51.1
Louisville, Ky.	21.2	30.4	24.8	24.9	35.1	29.1	30.1	40.9	34.5	40.4	53.4	44.5	48.1	61.2	48.1

APPENDIX 24.

Signal Service, United States Army, for each month of the year. (Compiled from the com-
to December 31, 1884.)

from August 25, 1872, to November 1, 1879, at 7.35 a. m., 4.35 and 11 p. m. (Washington time); and from
7 a. m., 3 and 11 p. m. (Washington time).]

June.			July.			August.			September.			October.			November.			December.		
a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
54.7	59.9	51.2	55.6	65.1	58.4	56.4	59.7	65.5	57.2	54.5	59.4	53.3	45.7	49.8	45.5	34.2	37.5	34.6	23.5	27.1
62.0	70.0	60.7	67.4	75.1	68.1	65.2	73.7	65.1	57.9	66.1	58.8	47.5	55.0	48.9	35.7	41.5	37.1	25.5	31.2	27.3
42.4	46.7	42.5	44.0	50.3	46.3	45.6	50.1	44.2	39.5	42.8	39.7	29.4	31.7	29.6	15.8	17.2	16.2	8.5	9.5	9.4
64.9	71.6	62.1	70.0	76.4	67.7	67.5	74.6	66.2	60.0	67.7	59.5	49.3	57.0	49.8	36.6	43.1	37.6	27.1	33.8	29.0
61.3	65.8	60.1	68.8	72.2	66.5	66.4	72.0	66.9	63.0	67.7	63.3	53.2	56.2	54.3	42.9	47.0	44.7	34.7	37.6	33.0
60.2	72.3	63.9	70.9	77.6	69.4	68.0	75.8	67.4	61.2	69.6	61.5	50.1	59.1	51.5	37.5	45.1	39.6	28.2	34.6	30.6
65.3	69.5	62.4	70.8	75.0	68.0	69.0	73.9	67.1	61.7	67.7	60.9	51.4	57.8	51.8	38.5	44.6	39.8	29.5	34.9	31.8
66.3	74.5	65.0	69.8	78.2	69.1	67.3	77.6	67.7	59.6	69.8	60.8	47.5	56.9	49.4	36.3	44.3	38.0	28.3	30.9	28.4
65.7	74.0	66.8	72.0	78.4	71.1	69.8	77.1	70.1	62.6	70.7	63.7	52.3	60.4	54.2	39.7	46.0	41.0	30.7	36.0	32.5
67.8	77.8	68.4	72.5	82.2	73.3	70.4	79.6	71.3	62.8	72.9	64.8	52.2	62.6	54.2	39.9	47.7	42.1	31.7	37.6	33.9
68.1	79.4	69.4	71.2	78.2	69.4	70.5	75.4	70.0	65.3	71.0	65.5	54.8	61.1	55.5	41.7	48.0	43.1	33.4	38.6	35.0
67.1	69.5	63.2	72.6	75.0	68.9	71.4	74.2	69.2	65.7	69.8	64.7	54.8	59.9	54.6	41.9	47.3	42.6	33.0	38.2	34.8
66.7	71.7	65.5	71.9	77.1	71.6	71.6	76.3	71.5	66.0	71.6	66.9	56.7	62.2	58.0	44.3	49.1	45.7	35.6	39.7	37.5
68.4	73.7	66.5	71.9	78.9	71.6	70.3	77.2	70.8	64.5	71.5	65.8	54.3	60.8	55.6	42.4	47.5	44.0	32.9	37.4	34.6
68.4	74.0	67.5	70.9	77.6	71.3	70.1	76.0	70.3	67.4	74.0	68.4	58.2	64.7	59.4	45.4	51.2	48.3	36.0	41.3	37.2
70.6	76.4	67.0	75.0	84.7	75.2	71.4	81.4	73.1	63.9	74.4	66.1	58.5	64.0	58.2	42.2	49.6	44.2	33.9	40.6	36.6
69.9	80.7	70.0	74.0	85.0	74.5	70.7	81.8	71.8	63.2	75.5	64.0	52.0	65.0	54.7	39.7	45.0	42.3	32.0	40.6	36.6
72.0	77.7	70.0	76.5	82.3	74.8	74.7	79.9	73.9	69.0	81.2	69.8	61.5	68.8	61.5	49.6	55.0	50.7	41.1	46.6	43.0
69.4	73.2	67.0	73.0	78.1	72.1	72.8	75.1	71.7	68.7	73.8	69.1	58.3	64.5	59.0	45.1	51.6	47.9	36.4	42.3	38.1
71.4	80.9	71.1	75.8	85.2	75.4	71.8	82.5	72.9	64.2	76.4	65.9	52.9	68.5	55.8	40.9	45.2	43.9	34.6	44.2	39.7
73.8	81.4	71.4	78.0	85.1	75.4	75.8	81.9	73.9	68.3	76.2	68.4	57.8	66.6	59.4	46.7	54.2	48.6	39.3	46.4	41.7
72.0	82.2	73.4	75.1	85.8	77.0	71.7	82.0	74.9	64.8	77.0	68.3	55.9	69.6	60.5	43.9	56.6	48.5	38.0	48.9	42.2
73.0	78.2	71.6	77.0	82.0	75.7	76.1	80.7	75.3	73.8	78.7	73.4	66.1	70.5	66.1	54.3	58.7	55.5	45.7	49.0	46.8
71.2	77.7	70.5	76.9	82.1	75.7	75.3	80.2	74.7	70.7	76.6	71.0	62.2	67.2	62.5	50.9	56.3	52.1	42.8	47.9	44.5
73.1	79.0	73.1	77.1	82.5	76.9	75.6	81.5	76.0	72.8	78.6	73.6	64.7	71.8	66.1	52.2	60.4	54.1	45.2	52.8	47.2
74.6	81.2	74.7	78.6	85.5	78.9	76.4	83.7	77.8	71.4	79.1	73.2	62.6	70.9	64.8	50.5	59.0	52.7	44.0	52.4	47.3
74.6	81.9	75.4	78.1	85.8	77.4	75.7	83.4	77.2	69.8	79.1	71.3	59.7	70.8	62.2	45.6	51.0	52.6	42.8	54.0	46.5
77.2	84.1	77.3	80.6	87.2	80.8	78.0	84.8	79.3	72.8	80.5	75.0	63.5	72.0	66.1	53.6	62.3	56.4	47.1	55.8	50.4
74.4	82.7	75.9	77.9	89.2	79.1	75.0	86.7	77.1	72.3	82.8	74.0	61.8	74.0	61.8	47.3	62.3	51.8	41.9	57.4	46.2
76.4	84.7	77.7	81.4	87.3	79.0	78.4	85.1	78.2	72.7	80.7	74.1	62.6	72.9	65.7	52.8	63.9	56.7	47.1	58.5	51.4
76.4	85.0	77.7	81.2	87.3	79.2	79.4	85.8	77.7	75.0	82.7	75.8	66.5	75.9	68.3	51.7	68.0	60.0	50.7	62.8	54.5
78.3	84.9	78.8	80.7	86.5	80.9	78.8	86.6	79.7	75.4	85.1	78.3	70.1	79.4	72.8	60.1	69.5	63.1	56.0	64.2	59.0
82.0	86.6	81.0	82.8	87.4	82.0	82.6	87.8	82.3	81.3	86.0	81.2	77.7	81.7	77.7	63.1	77.5	73.8	68.5	73.8	69.8
77.8	83.6	74.5	79.8	89.4	79.2	77.4	87.0	77.0	75.0	83.0	75.7	71.7	80.4	72.4	63.7	73.4	64.6	58.8	71.8	61.4
70.9	81.3	73.8	78.4	85.0	77.3	70.4	81.8	74.1	65.5	78.4	70.8	58.3	70.8	63.1	46.0	58.0	50.3	40.4	50.6	44.9
77.1	84.2	77.9	78.2	85.6	79.3	76.5	86.4	78.9	72.7	83.1	76.0	67.1	77.8	70.6	54.5	65.8	58.1	51.1	60.5	55.4
76.8	87.0	78.3	78.4	88.0	80.0	76.5	86.6	79.1	71.6	83.5	75.2	62.5	75.7	66.6	52.6	64.7	56.0	47.4	57.1	51.2
74.8	86.3	77.7	77.5	89.6	79.9	75.1	87.2	78.1	68.9	83.6	73.9	59.1	74.8	64.5	48.6	62.2	53.6	43.9	55.6	48.1
73.3	87.1	77.7	77.2	89.2	79.4	75.0	88.5	77.8	68.5	83.5	73.2	58.4	74.5	64.0	49.1	62.2	53.6	45.0	56.2	49.6
78.8	84.9	79.9	280.6	86.6	81.2	78.8	86.0	80.6	75.4	82.7	77.1	67.1	75.7	69.5	57.2	63.7	60.0	52.2	60.4	55.0
78.9	88.5	78.3	77.9	91.1	80.8	76.1	90.1	79.7	68.6	83.5	72.9	59.1	73.1	65.0	47.8	61.9	53.2	43.1	55.2	47.8
69.7	85.7	74.9	72.7	88.0	77.5	69.1	86.2	74.9	63.8	83.3	70.5	57.9	75.5	62.2	44.6	59.8	49.4	34.7	47.3	39.0
72.0	84.9	76.8	74.7	87.3	79.4	71.8	85.5	76.8	65.5	80.2	71.1	58.7	72.3	64.3	46.0	60.7	50.8	40.5	50.3	45.0
79.9	87.0	80.1	77.7	88.9	83.0	80.7	87.7	82.5	76.8	83.0	79.1	69.8	79.1	69.8	61.5	53.9	50.0	45.3	50.0	45.3
79.8	88.2	77.9	78.1	88.4	81.5	79.8	87.3	81.1	76.2	83.1	78.5	69.4	77.3	72.3	58.6	66.2	61.4	52.9	60.1	55.7
72.6	85.6	77.1	78.1	89.4	80.0	172.2	88.3	78.5	68.3	84.2	74.9	62.4	76.1	67.6	51.1	63.4	55.8	44.3	55.6	49.8
78.2	86.9	81.1	80.6	90.1	82.2	78.7	89.5	81.1	74.9	86.0	78.0	71.1	81.7	74.0	60.7	71.4	64.1	56.0	66.3	58.9
74.5	82.8	79.0	78.5	97.5	83.9	77.1	94.0	80.8	73.2	91.3	79.8	67.0	84.1	72.4	57.9	72.5	62.6	52.4	67.3	58.4
68.1	82.6	72.3	73.0	86.0	75.6	70.1	82.0	73.4	64.0	78.9	68.5	57.8	71.5	62.1	43.9	56.4	48.4	39.2	48.8	42.6
70.2	81.1	70.7	73.0	84.0	74.0	68.9	83.2	72.0	61.7	78.0	65.8	50.8	70.5	62.1	40.2	53.2	44.5	34.2	44.9	38.1
73.9	84.9	75.3	75.8	87.0	78.4	74.3	86.4	76.7	65.5	79.0	60.7	56.0	70.4	60.5	44.3	55.8	48.6	37.9	47.0	42.1
73.3	83.7	74.7	76.1	86.8	77.0	73.1	85.6	75.7	64.6	78.6	68.6	54.4	70.1	58.9	42.3	54.2	48.9	36.0	47.0	40.4
76.7	81.6	72.7	76.4	85.1	77.0	70.8	83.5	74.7	62.8	76.7	67.6	52.6	75.8	67.4	40.9	50.0	44.4	34.7	41.2	37.3

Mean a. m., p. m., and midnight temperatures, in degrees Fahrenheit, at stations

Stations.	January.			February.			March.			April.			May.		
	a.	p.	Mid.	a.	p.	Mid.	a.	p.	Mid.	a.	p.	Mid.	a.	p.	Mid.
Ohio Valley and Tennessee—Continued:															
Indianapolis, Ind.	25.6	33.5	29.0	26.7	38.6	33.9	35.2	45.9	39.8	47.2	59.0	51.2	59.4	71.0	62.0
Cincinnati, Ohio	30.6	37.9	33.4	33.7	42.6	37.8	38.9	49.0	43.2	44.1	60.8	53.7	60.0	72.7	64.2
Columbus, Ohio	25.6	32.2	28.8	31.1	38.2	34.8	35.1	44.2	39.3	44.6	55.4	49.4	57.3	70.5	61.7
Pittsburg, Pa.	28.1	34.8	31.1	29.5	38.0	32.5	33.9	43.9	37.7	44.3	56.7	48.0	55.9	70.7	59.4
Lower Lakes:															
Buffalo, N. Y.	23.2	26.4	24.2	23.0	28.0	25.2	28.6	33.0	30.1	38.9	44.8	40.0	51.4	57.4	52.2
Oswego, N. Y.	24.1	29.8	25.5	24.2	29.4	26.2	29.6	34.7	31.8	40.0	45.5	41.8	51.8	59.4	53.0
Rochester, N. Y.	22.5	26.0	23.5	22.8	28.3	24.6	28.1	34.3	29.7	38.0	47.3	41.2	53.5	62.5	54.1
Erie, Pa.	25.5	29.7	27.3	26.3	31.5	28.9	31.0	36.4	33.6	41.5	47.7	42.4	55.5	61.7	55.7
Cleveland, Ohio	24.2	28.9	25.8	25.0	31.5	28.5	31.0	37.1	33.9	42.6	48.6	44.1	54.9	62.2	57.0
Sandusky, Ohio	25.5	30.3	27.6	29.0	34.0	31.6	34.2	39.3	36.0	44.3	50.5	46.0	57.0	64.7	59.0
Toledo, Ohio	24.4	30.6	26.6	26.2	33.7	29.7	32.2	40.1	35.4	43.9	52.5	46.0	57.0	63.2	58.1
Detroit, Mich.	22.2	27.5	23.9	24.1	31.3	26.5	29.4	37.5	32.2	40.8	51.1	42.3	53.5	64.7	53.4
Upper Lakes:															
Alpena, Mich.	15.3	22.0	17.3	14.4	23.9	18.0	20.1	29.2	23.4	33.0	40.8	34.1	44.9	53.1	46.7
Escanaba, Mich.	10.9	18.8	14.0	11.5	22.0	15.7	16.8	29.1	21.4	31.8	41.1	34.0	44.8	54.4	47.2
Grand Haven, Mich.	23.4	27.3	24.8	22.9	29.9	26.0	27.9	34.9	31.0	40.4	47.5	42.4	53.8	63.9	53.5
Mackinaw City, Mich.	12.3	17.8	14.2	9.8	18.6	13.9	14.3	26.8	19.6	33.2	41.6	35.1	43.3	51.2	44.0
Marquette, Mich.	14.3	20.7	16.4	14.2	23.6	17.6	19.9	29.5	23.1	33.8	41.9	35.3	47.8	55.5	47.0
Port Huron, Mich.	18.8	25.0	20.9	20.0	28.0	23.7	26.3	33.0	29.0	38.5	44.7	39.2	50.6	58.8	50.9
Chicago, Ill.	21.6	28.2	24.3	23.1	32.6	28.9	31.3	38.0	34.8	42.2	48.7	45.0	55.4	66.0	55.6
Milwaukee, Wis.	17.3	23.8	20.1	20.6	28.2	24.7	27.7	34.2	30.7	39.0	45.2	41.8	51.5	62.5	52.4
Duluth, Minn.	6.6	16.4	11.2	11.4	22.3	17.1	18.4	30.6	24.5	33.8	43.1	37.4	45.2	53.8	47.4
Upper Mississippi Valley:															
Saint Paul, Minn.	8.4	17.3	12.1	12.4	24.4	17.5	22.5	34.7	28.2	38.0	51.8	43.9	53.3	66.1	57.3
La Crosse, Wis.	11.9	20.7	16.0	16.0	28.0	22.8	25.5	36.8	32.1	40.6	52.8	46.8	54.4	66.7	60.0
Davenport, Iowa	17.6	26.0	21.5	22.4	32.0	27.7	30.2	40.6	35.5	44.2	55.5	48.4	56.0	66.0	60.5
Des Moines, Iowa	15.1	25.1	20.1	20.2	31.4	25.5	29.3	41.4	34.8	41.9	57.0	48.8	54.1	66.0	60.4
Dubuque, Iowa	13.8	24.4	19.4	18.5	31.1	25.1	27.9	39.4	33.1	41.4	55.2	47.0	55.5	66.8	60.6
Keokuk, Iowa	20.3	29.5	24.5	25.5	30.0	30.3	32.4	40.3	37.3	45.5	55.8	50.3	58.2	70.1	62.0
Keosau, Ill.	31.4	39.8	35.2	36.2	45.0	46.4	49.2	63.2	54.7	62.5	76.4	67.7	73.2	84.7	76.4
Springfield, Ill.	25.1	31.2	27.0	30.2	38.2	33.7	35.3	44.5	39.6	47.7	59.4	52.5	57.9	69.0	63.6
Saint Louis, Mo.	27.4	35.7	30.7	31.3	41.1	36.0	37.3	49.1	42.9	48.8	61.9	54.3	60.5	72.8	66.7
Missouri Valley:															
Leavenworth, Kans.	21.9	31.2	25.8	26.1	39.1	32.5	34.0	48.2	40.4	46.1	59.2	52.6	58.4	72.2	63.9
Omaha, Nebr.	15.8	26.5	20.6	21.0	33.2	26.9	29.2	42.6	35.1	42.8	55.6	49.0	54.2	69.0	60.5
Bennett, Fort, Dak.	8.8	17.3	10.0	9.0	23.2	16.4	21.4	35.7	28.0	34.9	51.6	42.4	48.2	65.5	58.3
Huron, Dak.	4.5	15.9	9.1	8.4	21.5	13.3	22.5	33.3	27.4	33.0	51.7	43.0	45.7	60.7	51.9
Yankton, Dak.	9.4	22.5	14.2	13.6	27.5	19.6	23.4	37.7	28.9	37.5	53.9	43.6	53.2	67.7	57.0
Extreme Northwest:															
Moorhead, Minn.	8.4	3.2	2.8	0.8	11.4	5.8	9.7	23.2	17.5	31.4	44.7	37.7	54.5	69.2	52.6
St. Vincent, Minn.	10.8	1.8	7.8	5.1	6.0	0.5	5.7	19.4	13.1	27.7	40.8	33.8	44.4	59.4	50.0
Blismark, Dak.	0.3	12.2	5.0	5.7	18.2	10.2	15.5	29.7	20.8	33.0	44.0	38.8	48.0	62.8	53.3
Buford, Fort, Dak.	2.0	13.5	5.2	3.1	16.5	8.2	15.5	29.9	21.2	32.2	45.0	39.2	48.8	63.7	54.1
Northern Slope:															
Assinaboine, Fort, Mont.	8.0	13.6	9.8	9.3	16.8	14.1	23.0	34.4	28.3	32.9	50.2	41.2	43.3	61.0	52.8
Benton, Fort, Mont.	11.9	21.8	14.7	13.1	23.0	19.1	25.6	42.8	31.8	39.2	52.2	40.9	49.2	74.2	63.6
Custer, Fort, Mont.	12.9	23.6	16.6	14.4	23.8	20.1	23.9	39.9	31.5	38.8	53.7	44.4	54.4	65.4	54.8
Helena, Mont.	11.7	17.9	15.4	15.7	23.6	19.9	23.8	38.7	33.4	38.5	47.8	41.1	44.4	58.6	61.9
Maginnis, Fort, Mont.	14.2	20.4	17.6	9.4	18.4	12.8	24.4	35.9	26.2	33.1	45.6	35.3	42.2	56.4	44.0
Poplar River, Mont.	5.3	9.3	2.6	11.2	1.7	4.1	20.5	33.6	22.6	30.9	54.7	47.9	57.4	68.2	55.4
Shaw, Fort, Mont.	14.2	21.1	16.0	15.7	24.8	18.6	24.8	41.2	30.8	39.0	54.9	43.9	40.4	55.9	45.0
Deadwood, Dak.	17.6	29.2	20.1	19.0	30.6	24.2	25.4	42.9	38.0	43.2	58.6	50.8	43.8	53.5	44.7
Cheyenne, Wyo.	20.0	32.5	22.5	21.8	36.6	25.3	25.9	42.9	38.0	43.1	54.9	47.7	53.7	74.2	61.3
North Platte, Nebr.	12.7	30.0	18.7	18.0	36.6	24.7	27.7	45.4	34.4	43.8	56.7	54.3	51.0	67.2	57.1
Middle Slope:															
Denver, Colo.	20.7	36.0	25.9	24.5	40.9	30.5	30.8	49.9	38.9	36.6	53.4	44.8	47.7	63.8	55.3
Pike's Peak, Colo.	0.6	5.4	2.1	1.0	6.9	2.9	4.1	12.0	6.5	8.6	17.4	11.6	13.8	23.7	20.8
West Las Animas, Colo.	10.8	35.2	19.6	15.0	39.9	25.7	28.0	54.1	40.6	48.6	61.0	44.8	47.7	63.8	55.3
Dodge City, Kans.	19.3	35.1	25.5	24.6	43.8	32.0	32.0	53.0	40.8	48.6	64.4	55.1	54.9	73.8	61.1
Elliot, Fort, Tex.	23.7	41.8	29.8	26.6	45.8	34.1	36.4	56.8	44.2	44.3	67.4	54.9	54.0	72.6	62.7
Southern Slope:															
Sill, Fort, Ind. T.	30.3	44.0	35.7	35.2	50.9	41.8	43.7	62.7	51.6	65.8	77.2	76.1	82.7	77.8	68.1
Concho, Fort, Tex.	33.9	54.4	40.8	39.4	59.1	46.5	47.7	70.8	56.2	58.8	77.4	63.3	68.8	84.2	70.2
Davis, Fort, Tex.	33.6	54.8	41.8	38.0	60.3	46.9	43.2	67.2	53.8	54.9	72.2	58.8	58.9	79.8	66.9
Stockton, Fort, Tex.	34.4	55.5	40.0	38.8	61.0	47.0	45.7	70.0	55.5	57.1	77.7	63.2	66.4	84.4	70.9
Southern Plateau:															
El Paso, Tex.	36.7	53.7	44.7	41.4	60.4	49.6	45.8	68.0	56.4	51.4	75.3	63.2	65.6	83.5	72.2
Apache, Fort, Ariz.	23.0	46.0	32.3	27.0	50.3	27.4	32.4	58.2	43.5	53.5	66.5	44.9	54.0	67.3	55.7

of the Signal Service, United States Army, for each month of the year, &c.—Continued.

June.			July.			August.			September.			October.			November.			December.		
a. n.	p. m.	Mid.	a. n.	p. m.	Mid.	a. n.	p. m.	Mid.	a. n.	p. m.	Mid.	a. n.	p. m.	Mid.	a. n.	p. m.	Mid.	a. n.	p. m.	Mid.
68.8	79.1	70.2	72.4	83.0	74.0	68.7	81.8	71.9	59.8	73.8	64.0	49.7	62.4	54.3	36.5	45.6	46.2	29.2	38.1	32.3
69.5	80.7	72.5	73.3	84.8	76.0	70.3	82.5	74.5	62.5	75.3	67.0	52.4	64.4	56.7	40.5	49.3	43.5	33.5	44.0	36.3
66.2	77.4	69.3	70.4	82.2	73.7	66.5	80.0	68.4	60.1	74.1	64.5	51.2	63.4	55.3	37.0	46.6	40.8	29.7	35.1	31.8
65.4	78.9	68.1	68.5	82.3	70.8	65.3	81.1	69.2	58.4	73.9	62.4	49.0	62.0	52.0	37.3	45.4	39.2	30.7	36.5	32.5
61.6	68.5	63.0	67.3	73.4	68.2	66.2	74.2	67.5	59.2	66.9	60.4	48.3	54.7	49.7	35.7	39.8	33.6	27.7	30.5	28.9
62.1	69.2	62.2	67.5	74.5	68.0	66.7	74.4	68.0	59.3	67.3	60.8	48.8	55.2	50.3	37.2	40.5	33.8	28.3	31.5	29.5
63.2	71.8	63.0	67.6	76.5	67.5	65.6	75.6	68.5	58.7	67.9	59.6	47.4	55.3	48.7	34.4	39.5	33.5	28.4	29.8	27.5
65.5	72.2	65.2	70.0	76.1	70.0	67.9	75.3	68.8	61.3	68.5	62.5	50.9	57.3	52.5	38.6	43.1	39.8	30.9	34.8	32.6
64.8	73.2	65.5	69.0	76.4	69.8	66.8	75.5	68.7	59.7	69.1	62.2	49.4	58.2	52.2	36.5	42.1	38.8	28.2	32.2	29.5
62.5	72.4	66.8	67.0	77.4	72.0	68.4	77.4	71.0	61.9	70.4	64.4	52.3	59.6	54.8	38.5	44.2	40.2	31.0	34.4	32.0
67.2	75.2	67.7	70.5	79.7	71.5	67.5	77.8	69.9	59.4	70.5	62.4	49.1	58.9	52.5	36.3	43.1	38.8	28.3	33.4	30.4
67.5	76.5	68.7	67.0	78.4	69.1	65.3	77.0	68.3	58.0	69.3	60.9	47.7	57.4	50.8	35.0	41.0	36.8	26.9	31.3	28.4
57.9	63.7	56.9	63.2	70.2	62.8	61.3	70.0	62.0	53.8	62.3	54.9	42.3	49.9	44.0	30.3	34.9	31.2	21.6	26.1	22.9
57.7	65.8	58.3	63.1	72.6	63.8	61.1	70.9	63.1	52.6	61.9	55.0	42.0	49.2	44.2	28.3	34.4	30.4	18.1	23.7	20.1
63.5	68.5	62.0	68.1	73.2	66.8	65.8	72.8	66.2	58.1	65.6	59.3	47.5	54.7	49.7	35.1	39.7	37.0	27.8	30.8	29.1
53.0	64.9	56.8	58.8	66.4	59.4	55.9	67.4	59.4	55.2	62.3	55.9	46.1	52.1	47.5	33.9	38.0	35.2	24.3	26.9	25.2
58.0	63.5	56.4	63.0	70.6	62.6	62.0	70.7	62.2	53.5	62.4	54.1	43.0	50.1	44.5	28.7	34.3	30.4	20.9	22.7	21.4
60.6	66.0	60.4	65.6	73.5	65.8	64.1	73.4	65.9	57.4	67.1	52.2	46.4	58.4	48.3	33.4	39.5	34.8	24.5	29.4	26.4
63.6	68.1	64.0	69.5	76.0	70.9	68.2	75.8	70.8	59.8	69.2	63.6	48.7	57.5	52.2	35.3	42.1	38.8	28.2	32.2	29.2
61.0	66.9	61.4	66.3	73.4	66.5	64.4	73.6	67.2	56.9	66.1	59.9	45.7	54.2	48.4	31.4	37.7	34.3	21.6	27.2	24.3
55.1	63.3	56.6	62.6	72.6	64.3	62.1	71.8	63.7	52.2	61.7	54.9	41.3	49.7	44.4	25.2	32.4	27.9	12.1	12.0	15.2
61.7	72.9	65.4	65.7	79.4	69.6	63.4	77.7	68.0	52.6	66.6	57.4	42.3	53.8	45.7	26.4	35.0	29.5	15.0	22.4	17.8
63.4	74.9	68.1	67.4	79.6	72.5	65.5	78.2	70.3	56.0	67.8	60.7	45.8	55.6	49.8	29.7	37.8	33.0	18.8	23.1	22.5
65.6	76.5	69.2	69.6	81.5	73.9	67.4	80.2	72.2	58.3	71.7	63.0	47.5	59.2	52.0	33.0	42.2	36.7	24.1	29.1	27.1
63.6	74.9	68.2	67.0	81.2	72.6	66.1	81.3	71.6	57.0	72.2	62.4	47.3	60.8	53.1	32.1	43.2	38.3	20.2	28.1	26.8
63.3	75.5	67.0	68.5	81.8	72.9	65.7	80.3	70.2	56.7	70.4	61.0	44.5	58.1	50.5	30.6	40.6	36.4	21.4	29.6	25.2
68.3	78.6	70.4	72.7	84.0	75.1	69.5	83.1	73.3	60.3	74.1	64.5	49.0	62.0	53.8	34.0	44.4	40.7	24.9	32.6	28.3
71.3	81.7	74.4	75.3	85.5	77.6	73.0	84.6	75.8	63.5	77.4	67.9	53.7	67.9	58.4	41.5	51.5	44.5	34.2	42.7	37.8
66.6	76.7	67.2	70.7	83.2	74.8	67.6	81.7	72.8	59.3	74.6	65.0	52.1	64.0	56.4	37.5	46.9	41.2	28.8	34.8	31.6
69.5	81.0	73.2	73.7	85.1	77.3	70.9	83.5	75.6	62.0	76.0	67.5	51.6	63.9	56.1	38.0	48.1	42.8	30.4	38.1	34.0
63.2	81.0	72.4	72.1	85.0	78.6	69.4	84.4	75.0	60.1	75.8	65.6	48.5	64.4	55.8	34.4	46.8	38.8	25.6	35.6	29.4
66.2	78.7	70.0	70.4	83.4	74.6	67.9	82.4	72.8	56.6	72.1	62.8	45.7	61.0	53.1	30.3	42.2	33.5	20.2	29.8	24.0
66.2	77.6	68.8	69.2	80.7	73.0	68.2	83.4	70.5	56.2	72.0	58.2	43.8	58.3	44.6	21.3	38.8	32.7	12.1	25.4	17.2
53.8	74.9	65.1	61.1	76.7	68.9	60.0	78.6	67.4	49.4	68.7	55.7	39.7	55.7	44.5	24.8	39.8	32.8	12.2	25.0	15.8
62.6	76.7	68.4	67.0	81.4	71.6	66.4	82.0	70.7	52.6	72.0	59.0	41.3	58.9	47.2	25.8	40.0	33.0	15.2	27.1	18.9
57.5	73.3	63.5	59.4	74.8	65.0	58.2	75.5	64.7	47.4	64.9	53.7	38.0	49.9	41.9	18.6	30.1	22.2	5.2	15.2	8.6
55.0	71.0	60.4	55.0	72.6	61.8	55.1	73.3	61.8	44.4	62.2	50.5	33.7	44.7	38.5	15.6	26.2	18.0	2.0	9.6	3.7
57.6	72.8	61.6	61.8	78.5	67.8	58.9	73.2	66.3	46.9	66.6	53.9	35.7	53.0	44.1	19.7	31.9	23.7	9.1	18.8	12.0
55.8	73.8	62.6	58.0	77.5	64.9	55.6	79.0	66.8	43.6	66.6	52.0	34.8	51.4	42.2	19.5	31.6	23.1	8.8	14.1	6.2
54.4	71.8	64.2	53.2	75.7	66.8	55.6	75.4	66.0	44.9	61.9	52.8	34.5	46.9	39.9	23.8	33.9	27.9	14.8	22.4	16.2
53.5	73.2	62.9	58.6	79.6	68.2	57.5	79.4	68.6	45.6	65.5	55.2	34.2	50.2	41.0	23.8	37.7	32.9	14.3	26.0	19.3
55.6	73.6	64.4	58.9	80.1	70.8	58.3	80.9	70.9	45.7	68.8	57.7	36.5	55.7	44.5	23.8	41.1	32.8	12.9	24.6	16.9
53.8	68.6	61.4	50.7	73.2	66.2	58.9	75.3	68.1	50.1	61.5	56.3	37.5	47.0	42.3	26.9	33.8	29.4	17.2	23.8	20.0
53.8	63.0	56.2	55.4	70.2	56.8	55.8	75.0	59.7	44.6	61.3	43.7	34.3	46.9	37.4	27.7	39.5	31.4	17.0	25.0	18.3
59.4	80.2	68.5	55.5	73.9	62.7	55.3	77.4	63.8	44.2	63.4	52.4	30.5	55.4	44.2	14.4	32.8	23.2	6.3	4.2	4.0
54.0	69.0	60.0	51.5	74.6	63.5	55.0	75.5	63.8	43.1	62.9	51.1	35.0	48.0	39.9	26.0	37.0	29.0	18.0	26.2	20.3
54.4	67.9	66.8	55.9	72.0	62.4	55.9	72.9	61.7	46.3	63.7	52.0	39.0	51.1	42.2	27.4	38.4	30.3	17.4	27.0	20.0
51.0	73.5	59.2	55.5	79.3	66.3	54.1	77.6	70.6	44.4	60.1	52.9	35.8	55.7	41.1	27.7	41.5	29.8	22.7	24.7	24.7
60.4	78.0	68.6	65.6	82.2	71.7	63.1	82.8	70.2	51.7	73.7	59.8	40.1	61.3	47.6	25.4	45.9	31.9	18.2	35.1	22.3
56.1	77.8	66.1	67.1	85.1	71.7	60.0	81.0	69.0	49.9	72.8	60.6	40.3	61.4	44.4	29.6	47.7	35.4	23.9	38.7	27.8
28.8	77.7	71.1	53.8	84.4	73.1	58.7	83.9	57.1	27.1	136.8	29.9	18.0	25.9	20.1	8.4	13.7	10.1	4.5	8.5	5.2
56.6	80.5	67.5	53.2	86.1	74.0	60.2	84.7	71.5	52.4	79.5	64.4	42.0	65.7	52.0	23.6	33.8	33.3	19.8	40.8	26.4
63.0	83.1	70.6	63.8	87.5	75.9	66.9	85.2	73.3	58.0	78.8	65.0	45.9	66.6	53.2	30.0	40.7	33.6	23.1	40.2	28.6
65.7	83.7	72.9	66.5	87.5	75.9	64.8	84.0	73.2	58.6	79.0	66.2	49.2	67.4	53.6	32.8	42.2	33.2	26.4	43.9	31.2
70.6	86.7	77.6	173.5	90.7	79.7	71.0	89.7	78.0	63.4	83.8	71.5	54.3	72.8	61.1	39.5	57.0	45.6	30.4	44.5	36.0
71.1	91.2	77.7	174.1	93.0	80.4	70.2	90.7	77.8	64.6	88.4	71.8	56.7	76.6	62.2	43.4	61.5	48.8	37.5	55.6	43.1
66.0	85.6	73.9	67.6	84.8	73.6	63.7	80.6	70.3	58.2	76.9	65.9	52.2	71.5	56.8	40.4	60.7	48.7	35.0	50.0	42.8
66.7	90.2	77.7	87.1	91.5	79.8	67.9	88.5	76.8	62.2	82.9	70.4	54.2	74.8	61.7	41.8	62.2	47.7	36.8	56.8	43.0
69.8	92.9	80.0	87.3	92.8	80.8	69.9	89.1	77.5	62.2	83.8	71.5	53.4	75.7	61.7	41.4	61.5	49.0	37.8	55.9	45.2
48.6	85.0	77.1	109.2	85.2	71.4	58.9	81.0	68.7	49.1	178.5	61.3	39.5	69.1	151.0	27.6	50.7	38.4	25.3	49.1	34.0

Mean a. m., p. m., and midnight temperatures, in degrees Fahrenheit, at stations

Stations.	January.			February.			March.			April.			May.		
	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
Southern Plateau—Con- tinued:	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Grant, Fort, Ariz...	35.0	50.1	44.2	39.0	53.4	45.0	43.4	60.4	51.5	47.9	67.5	57.4	58.7	77.1	66.2
Prescott, Ariz.....	23.4	45.0	32.3	25.7	47.4	37.1	31.2	55.8	42.5	36.8	61.7	48.3	42.8	70.1	56.0
Thomas, Camp, Ariz.....	29.9	50.1	40.5	36.2	56.3	47.7	41.6	63.6	54.6	44.9	72.5	60.9	53.2	83.2	69.9
Yuma, Ariz.....	45.6	62.5	52.8	49.9	67.8	57.7	53.6	75.0	65.1	56.4	80.7	70.0	64.3	89.0	77.9
Middle Plateau:															
Salt Lake City, Utah	25.0	33.2	27.9	28.4	38.2	32.2	26.1	47.9	41.1	42.0	55.6	48.5	49.9	64.9	56.9
Northern Plateau:															
Boise City, Idaho...	22.7	34.2	30.5	27.5	38.1	34.7	35.3	49.9	44.6	40.5	57.4	51.7	46.7	65.9	58.2
Lewiston, Idaho....	29.0	34.0	31.8	26.4	34.2	30.8	37.1	48.3	44.3	43.0	57.3	52.2	48.9	66.0	60.9
Dayton, Wash.....	28.2	35.2	29.8	24.0	35.8	27.6	33.2	50.9	41.0	40.5	58.2	47.9	45.7	67.0	55.0
Spokane Falls, Wash.....	19.7	26.4	24.9	19.0	27.8	25.7	31.8	43.7	40.5	39.4	54.0	48.8	45.0	63.5	58.6
North Pacific Coast:															
Canby, Fort, Wash.	41.6	43.1	43.0	35.1	40.0	39.4	41.3	46.5	44.3	48.0	52.8	50.6	50.7	56.2	53.3
Olympia, Wash....	35.6	40.3	38.1	35.4	41.4	38.7	39.0	48.2	45.2	41.6	53.4	49.3	44.7	59.3	55.6
Tatoosh Island, Wash.....	39.9	42.2	42.4	35.3	37.1	37.4	41.3	44.4	42.4	47.2	51.3	49.0	48.5	53.1	51.0
Portland, Oreg.....	36.9	42.4	39.4	38.1	45.1	41.3	42.2	51.6	47.7	44.6	57.7	52.5	48.7	62.7	57.7
Roseburg, Oreg....	37.1	42.8	40.4	37.5	47.1	42.3	40.5	52.4	48.9	43.2	57.0	52.0	45.9	63.2	57.6
Middle Pacific Coast:															
Cape Mendocino, Cal.....	44.4	48.4	46.7	41.8	47.3	44.7	45.9	51.6	48.5	45.4	50.9	47.3	48.8	54.1	50.0
Red Bluff, Cal.....	40.3	49.7	46.2	42.7	53.0	49.4	46.9	60.5	55.5	50.5	65.6	59.9	58.3	74.2	67.5
Sacramento, Cal..	41.1	49.9	46.8	44.0	53.3	50.5	48.6	59.4	55.4	51.0	63.5	58.5	55.0	70.3	64.5
San Francisco, Cal.	47.8	53.0	51.0	48.5	54.9	51.8	49.9	57.4	53.0	50.6	59.9	53.4	52.2	61.6	55.3
South Pacific Coast:															
Los Angeles, Cal...	45.6	60.6	51.1	46.9	61.8	52.5	48.5	63.6	54.2	50.8	66.7	56.0	53.8	71.7	59.8
San Diego, Cal.....	48.1	60.6	52.6	49.3	60.4	53.6	50.9	61.3	54.9	52.6	63.6	57.0	56.7	66.2	60.1
Alaska Stations:															
Saint Michael's, Fort, Alaska.....	4.8	8.2	7.6	-3.5	0.1	0.7	5.0	10.5	11.8	13.8	20.6	22.2	22.8	43.4	36.3
Sitka, Alaska.....	36.3	37.7	36.8	31.0	34.1	33.0	34.7	39.9	23.7	23.8	9.4	6.4	9.4	6.4	9.7
Unalakshka, Alaska	31.3	34.0	33.7	31.5	32.3	32.2	30.7	33.8	33.4	32.0	36.7	36.0	36.9	40.8	41.6
Behring's Island, Behring Sea.....	25.5	25.4	26.3	28.2	28.3	30	26.0	25.8	28.4	28.0	29.0	32.0	34.2	35.6	38.1

of the Signal Service, United States Army, for each month of the year, &c.—Continued.

June.			July.			August.			September.			October.			November.			December.		
a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.	a. m.	p. m.	Mid.
66.2	86.1	76.0	68.8	85.9	77.8	67.5	82.5	73.9	62.9	79.8	70.5	53.6	70.7	60.9	42.1	58.9	49.1	37.2	53.3	44.6
51.3	81.0	67.6	61.0	84.0	72.0	59.5	80.8	69.5	50.1	76.6	62.4	40.1	66.0	50.7	29.3	55.4	38.8	28.7	48.7	34.8
61.6	94.1	80.9	71.3	94.8	83.6	70.0	90.5	80.1	59.7	85.3	73.2	46.0	74.0	60.9	35.1	61.1	47.8	33.2	53.8	43.0
71.4	98.8	86.8	80.4	103.3	93.1	80.1	101.4	91.0	71.8	96.0	83.7	61.6	83.6	70.8	51.0	71.5	50.2	47.3	65.4	54.3
57.4	76.8	66.9	66.5	84.8	74.6	65.9	83.8	74.1	55.9	73.5	63.1	46.0	59.2	50.3	33.9	44.7	37.0	29.2	37.4	31.7
54.0	76.1	68.7	58.8	83.5	75.2	58.0	83.3	75.1	48.0	66.6	61.4	38.8	56.0	48.8	31.3	44.2	38.3	28.2	36.5	32.1
53.7	74.0	69.0	61.6	70.7	76.9	60.0	79.1	76.0	51.1	66.5	61.5	43.0	54.4	49.5	34.2	42.4	38.0	29.4	34.3	31.6
52.0	74.2	62.8	55.0	80.0	67.1	54.4	80.5	65.3	48.3	70.1	56.1	41.0	56.8	46.6	33.6	43.0	35.9	27.7	34.3	29.4
51.2	70.8	67.3	55.6	76.2	72.0	54.3	76.8	70.7	46.2	63.8	57.0	38.7	49.8	45.3	31.8	30.5	34.6	24.0	30.6	28.0
51.0	57.3	55.4	56.0	61.7	58.2	58.0	64.0	60.1	55.6	60.2	57.2	50.1	52.6	51.0	47.8	50.6	49.0	39.0	41.9	40.2
49.3	61.6	61.6	51.6	67.8	64.8	53.1	68.0	64.6	49.0	61.6	56.4	45.1	53.1	48.3	41.1	46.9	43.5	37.7	41.8	39.9
50.6	55.8	53.4	52.1	58.8	55.6	53.3	58.8	57.0	50.9	54.5	53.2	47.6	50.5	49.2	45.0	47.1	46.8	38.4	40.0	39.8
51.7	68.2	63.5	56.7	72.6	68.8	56.1	71.9	67.2	52.7	67.0	61.4	47.7	58.4	52.5	42.2	48.7	44.8	38.4	43.3	40.8
51.1	69.3	63.9	53.8	73.6	68.9	53.1	73.1	68.1	49.6	68.0	62.2	44.2	56.3	50.4	39.8	47.1	43.6	38.5	43.6	41.0
51.8	57.6	54.2	51.2	56.0	54.2	52.5	57.1	55.4	54.6	60.0	56.9	50.7	55.8	53.3	49.2	53.7	51.2	47.5	50.3	49.4
63.7	84.8	79.4	68.4	91.4	80.3	67.1	90.9	84.2	61.1	80.6	73.8	53.2	70.0	62.3	45.5	59.6	52.2	41.8	51.0	47.0
59.0	77.9	70.2	60.8	82.8	73.8	60.2	82.3	73.0	58.7	78.7	69.8	51.5	68.5	61.0	44.9	58.5	53.0	42.4	51.5	47.6
54.4	64.0	57.4	54.7	63.3	56.9	55.1	63.5	57.2	55.7	65.2	58.3	55.1	64.0	58.4	52.3	59.0	56.7	49.0	53.9	52.1
58.1	75.9	68.2	60.2	80.0	64.7	60.9	81.4	66.2	58.4	79.3	64.8	54.1	73.1	60.2	49.5	68.9	55.0	47.9	63.3	52.9
60.5	69.6	63.3	53.5	72.5	65.7	65.0	78.9	75.1	62.5	72.1	65.4	58.0	69.0	61.3	52.6	65.7	56.6	50.0	62.5	54.1
41.6	47.8	49.2	50.1	55.1	55.9	44.6	48.6	49.2	41.3	45.3	45.1	28.2	31.5	31.0	14.8	17.5	16.7	3.5	6.1	5.6
48.1	53.2	52.3	50.8	55.8	54.8	52.2	58.2	57.0	49.2	54.2	52.2	42.9	47.4	45.6	39.0	40.6	39.4	34.7	35.8	35.2
43.3	47.3	47.6	47.8	50.7	51.4	48.3	53.0	53.0	45.6	49.8	49.8	38.7	42.4	42.1	33.4	36.3	35.7	32.0	32.2	32.0
40.0	41.6	45.0	45.4	46.8	50.0	50.3	51.1	54.1	45.3	46.5	49.8	37.0	38.0	39.6	33.9	30.0	30.3	27.0	28.0	28.2

APPENDIX 25.

Average temperature (in degrees Fahrenheit) of the surface of the ocean at stations of the Signal Service, United States Army, on the Atlantic and Gulf coasts for each month and the year. (Computed from observations taken at 2 p. m. (Washington time) daily, and from the date observations began to December 31, 1884.)

Stations.	Observations began.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Eastport, Me	May, 1874	35.7	33.0	32.7	35.4	39.1	42.9	46.7	49.6	50.5	49.7	46.0	40.7	41.8
Portland, Me	December, 1873	33.4	32.0	33.1	39.3	47.0	53.0	59.5	60.9	58.0	52.4	44.5	36.8	46.0
Boston, Mass	May, 1881	33.2	32.4	33.1	42.4	51.8	60.3	64.2	64.2	62.8	51.9	43.9	35.8	48.4
Block Island, R. I.	May, 1881	36.1	33.8	37.4	42.8	49.8	58.6	65.3	67.0	64.9	57.7	49.5	41.9	50.6
New London, Conn	April, 1874	36.0	33.5	38.7	46.6	56.3	66.6	71.4	72.0	67.9	59.8	49.5	40.4	53.4
New Haven, Conn.	May, 1881	32.4	33.0	36.5	45.5	56.4	66.5	72.1	73.1	68.8	58.6	46.3	37.3	52.2
New York City	December, 1873	33.3	32.7	35.8	43.7	54.8	63.4	72.4	73.0	69.3	60.0	48.3	38.3	52.3
Sandy Hook, N. J.	May, 1881	37.3	36.7	38.2	44.4	53.3	63.4	71.0	72.9	70.0	61.4	50.9	42.0	53.5
Atlantic City, N. J.	May, 1881	36.6	36.3	40.5	47.4	56.1	65.3	71.6	71.3	71.2	63.8	51.6	41.1	54.5
Delaware Breakwater, Del	March, 1880	37.2	41.8	44.1	52.3	63.6	75.3	80.0	78.6	75.8	66.6	51.7	42.0	59.2
Chincoteague, Va.	May, 1880	36.5	37.9	41.5	47.9	57.9	66.6	71.7	72.6	71.5	63.9	53.3	41.9	55.3
Norfolk, Va.	December, 1873	37.2	41.8	44.1	52.3	63.6	75.3	80.0	78.6	75.8	66.6	51.7	42.0	59.2
Fort Mifflin, N. C.	July, 1883	41.0	45.1	50.2	56.2	67.5	76.0	80.8	80.4	74.9	65.4	54.4	43.8	61.3
Wilmington, N. C.	December, 1873	46.9	57.3	58.2	60.6	72.4	78.3	81.4	79.8	77.3	70.6	61.4	53.2	66.3
Smithville, N. C.	December, 1873	47.6	51.8	56.0	62.4	72.3	78.6	83.2	81.8	78.9	69.3	58.4	49.7	65.6
Charleston, S. C.	April, 1874	50.9	53.0	56.5	64.4	73.1	80.0	83.7	83.3	78.5	71.3	60.8	53.5	66.4
Savannah, Ga.	December, 1873	49.9	54.1	58.9	64.5	72.9	80.0	84.5	83.9	78.9	71.8	60.3	53.4	67.5
Jacksonville, Fla.	December, 1873	57.3	61.4	66.9	71.3	78.4	83.5	86.6	85.5	82.2	75.5	67.5	59.4	73.0
Key West, Fla.	June, 1874	71.8	73.8	75.7	78.7	82.6	86.1	87.3	86.4	85.9	81.4	76.7	71.6	79.8
Cedar Key, Fla.	December, 1879	60.2	64.9	67.3	72.5	79.1	83.0	85.8	85.5	84.1	77.6	67.0	61.9	74.1
Pensacola, Fla.	April, 1881	55.8	62.6	65.0	71.1	78.5	83.0	85.7	84.7	82.5	77.1	68.2	63.5	72.4
Mobile, Ala.	December, 1873	50.5	54.2	59.6	65.6	74.3	82.4	85.7	84.9	81.9	74.6	63.7	57.7	69.3
Galveston, Tex.	December, 1873	54.8	57.7	64.1	70.8	78.3	84.3	86.4	85.6	81.5	75.8	64.1	57.7	71.7
Indianola, Tex.	May, 1874	54.1	59.8	65.0	71.6	78.3	84.5	86.4	87.0	83.7	77.9	68.4	59.8	73.8

APPENDIX 26.

Mean temperature (in degrees Fahrenheit) and average precipitation (in inches and hundredths) at stations of the Signal Service, United States Army, for each season of the year. (Computed from the commencement of observations at each, to and including December, 1884.)

[The mean temperature is deduced from the three telegraphic observations, taken at the same moment of Washington time at all stations. The seasons comprise the following months: Spring: March, April, and May; summer: June, July, and August; autumn: September, October, and November; and winter: December, January, and February. Observations prior to Aug. 25, 1872, were taken at 7.35 a. m., 4.35 and 11.35 p. m. (Washington time); from Aug. 25, 1872, to Nov. 1, 1879, at 7.35 a. m., 4.35 and 11.00 p. m. (Washington time), and from Nov. 1, 1879, to Dec. 31, 1884, at 7.00 a. m., 3.00 and 11.00 p. m. (Washington time).]

Stations.	Established.	Mean temperature.				Average precipitation.			
		Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
New England:		°	°	°	°	Inches.	Inches.	Inches.	Inches.
Eastport, Me.	Apr. 1, 1873	37.9	58.8	46.0	22.4	13.48	12.48	12.02	11.34
Portland, Me.	Jan. 15, 1871	43.6	67.3	49.8	26.3	9.54	10.56	10.27	9.68
Mount Washington, N. H.	Dec. 1, 1870	21.5	46.3	29.1	7.0	19.49	27.98	22.87	13.69
Boston, Mass.	Nov. 1, 1870	44.8	69.0	51.2	28.2	12.49	11.95	12.31	11.50
Block Island, R. I.	Sept. 1, 1880	43.5	66.4	55.0	33.2	13.50	12.28	12.78	16.36
New Haven, Conn.	Dec. 10, 1872	46.4	70.2	52.9	29.5	13.04	18.92	11.66	12.19
New London, Conn.	Jan. 10, 1871	45.6	68.9	52.7	30.1	12.43	13.30	11.67	11.27
Middle Atlantic States:									
Albany, N. Y.	Dec. 22, 1873	45.8	70.6	51.2	25.9	8.70	11.96	9.13	8.33
New York City	Nov. 1, 1870	47.7	71.5	54.6	31.5	10.16	12.86	10.15	10.25
Philadelphia, Pa.	Jan. 1, 1871	50.5	73.7	55.4	33.4	9.25	12.94	9.53	9.21
Atlantic City, N. J.	Dec. 10, 1873	47.4	70.4	56.2	33.9	10.07	11.61	9.75	11.80
Barnegat City, N. J.	Dec. 10, 1873	46.9	70.1	55.7	33.1	11.51	12.68	12.74	13.27
Cape May, N. J.	May 24, 1871	49.0	71.6	57.8	35.8	10.95	12.72	11.16	12.46
Sandy Hook, N. J.	Dec. 10, 1873	47.4	71.9	56.2	32.6	14.03	13.45	12.18	11.69
Del. Breakwater, Del.	Jan. 28, 1880	49.4	71.3	59.4	36.3	7.20	8.74	7.27	9.86
Baltimore, Md.	Jan. 1, 1871	53.8	75.9	57.1	36.3	10.14	12.54	9.98	9.04
Washington City	Nov. 1, 1870	53.0	75.4	56.6	35.0	10.25	13.42	9.90	9.52
Cape Henry, Va.	Dec. 15, 1873	55.0	75.8	62.3	42.3	14.87	15.06	13.27	13.09
Chincoteague, Va.	Mar. 16, 1880	50.3	72.3	63.2	37.2	8.81	10.83	8.51	12.92
Lynchburg, Va.	May 24, 1871	56.1	76.3	57.7	38.8	10.48	10.67	9.66	11.40
Norfolk, Va.	Jan. 1, 1871	57.0	77.3	60.7	42.2	12.18	15.70	11.95	11.78
South Atlantic States:									
Charlotte, N. C.	Oct. 6, 1878	59.6	77.1	61.5	43.8	13.30	14.65	10.52	16.00
Hatteras, N. C.	Dec. 1, 1880	57.1	76.6	66.4	46.4	17.51	17.61	20.32	18.17
Kitty Hawk, N. C.	Jan. 15, 1875	35.4	76.1	63.8	43.8	14.99	19.82	15.72	15.12
Macon, Fort, N. C.	May 23, 1878	58.8	77.2	66.0	47.3	13.81	18.30	13.59	13.46
Smithville, N. C.	Oct. 15, 1875	61.6	79.0	65.2	48.4	10.35	15.16	14.74	10.50
Wilmington, N. C.	Jan. 1, 1871	62.0	78.5	64.0	48.2	11.95	20.50	14.29	11.05
Charleston, S. C.	June 5, 1871	65.0	81.0	66.8	51.2	13.90	10.90	14.60	11.23
Augusta, Ga.	Nov. 2, 1870	64.2	80.2	64.5	48.8	13.40	13.42	10.21	12.40
Savannah, Ga.	Jan. 1, 1871	66.6	81.1	66.9	52.9	11.78	19.45	11.47	10.00
Jacksonville, Fla.	Sept. 11, 1871	69.1	81.4	69.9	56.8	10.47	17.79	16.70	9.74
Florida Peninsula:									
Cedar Keys, Fla.	Nov. 7, 1879	70.3	81.7	72.4	60.1	8.86	24.10	11.72	11.18
Key West, Fla.	Nov. 1, 1870	76.9	83.8	78.8	70.8	6.10	13.47	14.80	5.94
Sanford, Fla.	Sept. 1, 1882	71.6	80.5	73.8	61.6	8.41	22.35	10.23	4.73
Eastern Gulf States:									
Atlanta, Ga.	Sept. 25, 1878	61.3	76.5	62.4	46.1	15.70	11.36	9.86	19.16
Pensacola, Fla.	Oct. 27, 1879	67.9	80.3	69.5	56.0	14.34	22.53	15.52	14.92
Mobile, Ala.	Nov. 7, 1870	67.2	81.2	67.7	52.6	18.86	19.18	13.19	14.26
Montgomery, Ala.	Nov. 9, 1870	65.3	80.6	65.5	50.4	16.94	11.79	8.92	15.50
Vicksburg, Miss.	Sept. 10, 1871	66.0	80.8	65.5	50.4	19.55	11.37	13.45	10.69
New Orleans, La.	Nov. 1, 1870	69.0	81.9	69.9	56.0	17.80	18.44	13.28	14.77
Western Gulf States:									
Shreveport, La.	Sept. 2, 1871	66.1	81.9	65.2	48.9	16.26	9.17	12.82	15.37
Fort Smith, Ark.	June 1, 1882	59.4	77.7	62.8	37.7	9.90	9.01	12.98	13.91
Little Rock, Ark.	July 1, 1879	62.8	78.8	63.1	45.3	18.38	10.82	11.50	18.67
Galveston, Tex.	Apr. 19, 1871	69.9	83.5	71.4	55.5	10.83	13.21	17.20	11.77
Indianola, Tex.	May 1, 1872	70.4	82.8	71.5	55.6	7.54	9.28	18.79	7.01
Palestine, Tex.	Dec. 8, 1881	65.5	79.9	67.1	48.6	17.75	7.98	14.26	10.12

Mean temperature (in degrees Fahrenheit) and average precipitation (in inches and hundredths) at stations of the Signal Service, &c.—Continued.

Stations.	Established.	Mean temperature.				Average precipitation.			
		Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
Rio Grande Valley:		°	°	°	°	Inches.	Inches.	Inches.	Inches.
Brownsville, Tex.....	Aug. 25, 1875	74.3	83.5	78.6	60.4	4.89	9.08	13.07	5.29
Rio Grande City, Tex.....	May 28, 1875	76.0	85.2	72.3	60.8	4.75	7.37	8.37	2.49
Ohio Valley and Tennessee:									
Chatanooga, Tenn.....	Jan. 8, 1879	60.1	76.2	61.3	44.2	16.39	12.18	11.65	19.63
Knoxville, Tenn.....	Jan. 1, 1871	57.2	74.8	57.7	30.7	14.96	18.31	10.03	15.58
Memphis, Tenn.....	Feb. 28, 1871	61.3	79.5	60.9	42.7	17.66	11.81	11.23	15.77
Nashville, Tenn.....	Nov. 1, 1870	59.7	78.5	59.7	41.2	14.65	12.62	10.25	14.58
Louisville, Ky.....	Sept. 11, 1871	55.7	76.7	57.6	37.2	12.87	12.44	9.78	13.44
Indianapolis, Ind.....	Feb. 10, 1871	52.3	74.4	54.1	31.9	11.89	14.35	0.72	10.08
Cincinnati, Ohio.....	Nov. 1, 1870	54.6	76.1	56.9	31.9	10.73	12.91	8.50	11.51
Columbus, Ohio.....	July 1, 1878	50.9	73.0	54.7	31.9	11.11	11.10	9.33	11.00
Pittsburg, Pa.....	Nov. 1, 1870	50.1	72.3	53.3	32.3	8.32	11.54	7.64	8.57
Lower Lakes:									
Buffalo, N. Y.....	Nov. 1, 1870	41.9	67.9	50.2	28.4	8.33	9.73	10.32	8.60
Oswego, N. Y.....	Nov. 1, 1870	43.1	68.1	50.9	27.4	8.02	9.06	9.21	9.40
Rochester, N. Y.....	Nov. 1, 1870	43.3	68.6	49.7	25.7	9.15	9.74	8.38	9.10
Erie, Pa.....	May 25, 1878	45.0	70.0	52.7	29.7	9.26	10.44	13.02	10.25
Cleveland, Ohio.....	Nov. 1, 1870	45.8	69.9	52.0	24.2	8.71	11.82	9.51	8.60
Sandusky, Ohio.....	Aug. 2, 1877	48.0	71.0	54.0	30.6	8.93	13.00	10.05	8.43
Toledo, Ohio.....	Nov. 1, 1870	47.5	71.8	52.3	29.3	7.73	10.36	8.05	6.60
Detroit, Mich.....	Nov. 1, 1870	45.2	69.7	50.8	26.9	8.76	10.75	7.98	7.41
Upper Lakes:									
Alpena, Mich.....	Sept. 10, 1872	30.4	63.1	44.8	20.2	7.79	11.03	12.22	6.60
Escanaba, Mich.....	May 24, 1871	35.8	64.0	44.2	17.2	7.48	12.34	10.99	4.40
Grand Haven, Mich.....	May 24, 1871	43.4	67.5	49.6	26.9	8.98	10.82	11.24	7.02
Mackinaw City, Mich.....	Aug. 20, 1882	34.8	61.0	47.8	18.1	5.03	8.98	8.61	15.88
Marquette, Mich.....	May 1, 1871	36.9	63.1	44.6	19.3	6.02	10.62	11.39	4.65
Port Huron, Mich.....	July 25, 1874	41.2	66.4	49.0	24.2	9.21	9.60	8.38	6.74
Chicago, Ill.....	Nov. 1, 1870	46.0	69.8	51.7	27.6	10.42	10.87	9.50	6.56
Milwaukee, Wis.....	Nov. 1, 1870	42.0	66.9	48.2	23.1	9.48	10.25	8.05	5.76
Duluth, Minn.....	Nov. 1, 1870	37.1	63.5	43.5	14.9	7.84	13.03	9.47	3.54
Upper Mississippi Valley:									
Saint Paul, Minn.....	Nov. 1, 1870	43.9	69.5	45.7	17.0	7.81	11.98	6.95	3.44
La Crosse, Wis.....	Oct. 15, 1872	46.2	71.1	48.4	20.4	7.27	13.40	9.89	3.63
Davenport, Iowa.....	May 24, 1871	48.6	72.9	51.5	25.6	9.89	12.32	8.51	4.93
Des Moines, Iowa.....	Aug. 1, 1878	48.5	72.0	51.4	23.1	10.35	16.10	10.50	4.29
Dubuque, Iowa.....	July 10, 1873	47.4	71.6	49.8	23.2	9.36	14.45	10.42	4.82
Keokuk, Iowa.....	July 16, 1871	50.9	75.1	53.3	28.0	9.67	13.06	9.29	5.60
Cairo, Ill.....	June 1, 1871	57.9	77.6	58.5	38.2	12.79	11.57	9.90	12.53
Springfield, Ill.....	July 1, 1879	52.3	73.9	55.2	31.2	12.47	12.15	11.08	10.97
Saint Louis, Mo.....	Nov. 1, 1870	54.7	76.7	56.3	34.1	10.23	11.52	8.24	7.74
Missouri Valley:									
Leavenworth, Kans.....	May 21, 1871	53.0	76.0	54.3	29.6	11.19	14.13	9.11	4.62
Omaha, Nebr.....	Nov. 1, 1870	49.3	74.1	50.8	24.2	9.95	16.21	8.06	2.41
Bennett, Fort, Dak.....	Dec. 22, 1879	42.6	70.3	45.2	15.0	6.13	7.18	2.28	2.07
Huron, Dak.....	July 1, 1881	41.4	67.7	45.1	14.0	7.88	12.08	4.29	0.94
Yankton, Dak.....	April 1, 1873	44.8	71.4	47.5	18.7	8.88	11.84	4.88	2.22
Extreme Northwest:									
Moorhead, Minn.....	Jan. 1, 1881	36.0	65.8	40.5	4.2	5.92	12.93	7.23	3.12
Saint Vincent, Minn.....	Sept. 5, 1880	32.5	63.0	37.1	-0.3	3.91	8.78	5.32	1.37
Bismarck, Dak.....	Sept. 15, 1874	38.8	66.9	41.4	10.2	7.24	8.81	3.45	2.05
Buford, Fort, Dak.....	Oct. 23, 1878	38.9	65.8	40.3	8.0	3.93	6.31	2.18	2.22
Northern Slope:									
Assiniboine, Fort, Mont.....	Oct. 8, 1879	40.8	65.1	40.7	13.6	3.15	7.65	3.27	2.69
Benton, Fort, Mont.....	Oct. 11, 1879	42.5	67.3	42.6	17.5	4.47	4.70	2.73	1.96
Custer, Fort, Mont.....	Dec. 5, 1878	43.4	68.2	44.9	18.6	4.91	4.88	2.24	2.89
Helena, Mont.....	Oct. 15, 1879	42.1	65.0	42.6	18.4	2.78	4.53	3.76	4.42
Maginnis, Fort, Mont.....	July 14, 1882	38.0	61.5	41.3	17.0	2.75	2.31	2.80	2.77
Poplar River, Mont.....	May 1, 1882	40.8	66.2	40.2	-1.4	3.01	3.17	2.30	1.04
Shaw, Fort, Mont.....	Apr. 1, 1880	40.6	62.1	41.2	19.5	2.94	4.64	3.51	2.57
Deadwood, Dak.....	Dec. 25, 1877	40.1	66.6	42.9	22.5	12.27	8.56	3.41	3.42
Cheyenne, Wyo.....	Nov. 1, 1870	41.1	64.5	44.2	26.6	3.95	4.00	1.90	0.62
North Platte, Nebr.....	Sept. 18, 1874	47.0	71.3	48.6	24.0	5.87	8.97	3.05	1.74
Middle Slope:									
Denver, Colo.....	Nov. 19, 1871	47.4	69.8	49.6	20.9	5.57	4.94	2.34	1.83
Pike's Peak, Colo.....	Nov. 1, 1873	14.0	37.1	21.4	4.1	9.31	10.52	5.36	4.15
West Las Animas, Colo.....	Oct. 1, 1881	48.8	72.0	51.6	25.2	5.14	5.58	1.11	1.78
Dodge City, Kans.....	Sept. 15, 1874	52.6	75.1	53.7	30.2	6.41	9.91	3.07	1.51
Elliott, Fort, Tex.....	Nov. 29, 1870	54.8	74.4	55.4	33.7	6.08	9.16	6.52	1.46
Southern Slope:									
Sill, Fort, Ind. T.....	June 23, 1875	61.5	79.6	61.0	38.9	8.82	10.57	7.32	5.25
Concho, Fort, Tex.....	Oct. 10, 1875	65.1	80.7	63.2	45.6	7.73	9.69	8.06	3.87
Davis, Fort, Tex.....	Dec. 24, 1877	61.3	74.0	59.3	45.5	2.41	11.68	5.94	1.20

Mean temperature (in degrees Fahrenheit) and average precipitation (in inches and hundredths) at stations of the Signal Service, &c.—Continued.

Stations.	Established.	Mean temperature.				Average precipitation.			
		Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.	Winter.
Southern Slope—Continued:		°	°	°	°	Inches.	Inches.	Inches.	Inches.
Stockton, Fort, Tex	Feb. 26, 1876	64.3	79.2	62.0	46.0	2.39	6.88	8.13	1.81
Southern Plateau:									
Santa Fé, N. Mex.	Nov. 20, 1871	46.9	66.4	48.4	30.2	1.93	7.56	3.18	1.90
El Paso, Tex.	Nov. 5, 1877	64.0	80.6	62.2	47.2	1.10	5.94	3.44	2.02
Apache, Fort, Ariz.	Oct. 9, 1877	50.5	69.6	52.4	36.1	3.21	10.32	4.62	5.55
Grant, Fort, Ariz.	Nov. 1, 1875	58.7	76.2	60.9	44.4	2.10	8.04	2.86	3.01
Prescott, Ariz.	Nov. 19, 1873	49.4	69.7	52.2	35.4	2.90	5.58	2.35	4.57
Thomas, Camp, Ariz.	Sept. 22, 1877	60.4	80.7	60.1	43.4	2.29	4.50	1.36	3.58
Yuma, Ariz.	Nov. 18, 1873	70.2	89.6	73.9	56.1	0.39	0.47	0.16	1.51
Middle Plateau:									
Winnemucca, Nev.	July 1, 1877	47.1	68.9	47.2	30.9	2.83	0.95	1.50	3.40
Salt Lake City, Utah.	Mar. 19, 1874	49.2	72.5	51.6	31.5	6.59	2.10	4.13	4.18
Northern Plateau:									
Boise City, Idaho.	July 1, 1877	50.0	70.3	48.5	31.3	3.70	1.23	2.95	6.54
Lewiston, Idaho.	July 1, 1879	50.9	70.6	48.9	31.1	3.49	3.05	3.98	7.52
Dayton, Wash.	July 1, 1879	49.1	65.7	47.9	30.2	6.85	2.21	5.71	12.94
Spokane Falls, Wash.	Feb. 5, 1881	47.2	66.3	45.4	25.2	4.10	2.77	5.90	8.21
North Pacific Coast:									
Canby, Fort, Wash.	Sept. 1, 1883	49.3	58.2	52.8	40.4	6.46	5.12	16.86	17.54
Olympia, Wash.	July 1, 1877	48.6	60.7	49.4	38.8	12.35	2.89	15.74	28.16
Tatoosh Island, Wash.	Oct. 1, 1888	47.6	55.2	49.5	39.2	10.17	11.20	24.13	30.82
Portland, Oreg.	Nov. 1, 1871	51.6	64.4	52.8	40.6	12.72	3.36	13.78	23.14
Roseburg, Oreg.	July 16, 1877	51.2	64.1	51.7	41.0	8.72	1.92	7.31	17.63
Middle Pacific Coast:									
Cape Mendocino, Cal.	July 27, 1882	49.1	54.5	53.9	46.7	6.73	0.80	4.06	6.91
Red Bluff, Cal.	July 1, 1877	59.8	79.7	63.2	46.8	7.84	0.33	4.05	15.91
Sacramento, Cal.	July 1, 1877	58.5	71.1	60.5	47.3	8.37	0.81	2.54	11.85
San Francisco, Cal.	Mar. 8, 1871	54.6	58.5	58.2	51.8	6.06	0.35	3.91	14.10
South Pacific Coast:									
Los Angeles, Cal.	July 1, 1877	58.4	67.8	62.7	58.6	6.01	0.22	1.55	10.43
San Diego, Cal.	Nov. 1, 1871	58.1	66.8	62.6	54.6	2.63	0.30	1.19	6.75
Alaska Stations:									
Alexander, Fort, Alaska.	Aug. 1, 1881	.....	.....	.....	.....	6.55	9.17	10.85	8.49
Saint Michael's, Fort, Alaska.	June 28, 1874	20.7	50.8	30.2	3.7	1.79	5.19	5.00	1.77
Sitka, Alaska.	Mar. 30, 1881	42.1	53.6	45.6	35.0	19.19	14.95	34.40	32.21
Unalakshik, Alaska.	Aug. 18, 1878	35.7	48.8	40.8	32.4	17.09	10.74	29.28	30.97
Behring's Island, Behring Sea.	May 22, 1883	30.8	47.1	38.6	24.1	3.06	5.68	7.84	4.05

APPENDIX 27.

Normal precipitation and departure (of 1884) therefrom at stations of the Signal Service, commencement of observations

Stations.	Established.	January.		February.		March.		April.		May.			
		Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -		
New England:													
Eastport, Me.	Apr. 1, 1873	3.26	+1.11	4.24	+5.12	5.29	-1.55	2.67	+3.16	4.52	+2.27		
Portland, Me.	Jan. 15, 1871	8.32	+1.22	3.22	+3.70	8.35	+1.61	2.04	+3.38	3.25	+2.21		
Mount Washington, N. H.	Dec. 1, 1870	4.14	-1.69	4.15	+3.40	6.76	-2.59	5.80	-2.00	3.85	+2.69		
Boston, Mass.	Nov. 1, 1870	4.19	+2.08	3.68	+2.06	4.96	-0.10	4.06	+0.70	3.47	-0.16		
Thatcher's Island, Mass.	Dec. 26, 1875	1.30	+8.30	4.04	+3.50	5.64	-0.94	3.27	-1.06	3.50	+0.60		
Block Island, R. I.	Sept. 1, 1880	5.28	+1.15	6.47	+0.84	8.44	+1.56	3.58	+0.53	5.08	+1.31		
New Haven, Conn.	Dec. 10, 1872	4.24	+0.39	4.34	+1.23	5.20	-1.05	4.16	-1.80	2.68	-0.36		
New London, Conn.	Jan. 10, 1871	4.12	+2.00	3.63	+1.99	5.06	+0.47	3.91	+0.08	3.46	+2.18		
Middle Atlantic States:													
Albany, N. Y.	Dec. 22, 1873	2.74	+0.24	2.84	+1.01	2.94	+1.06	2.80	-0.71	2.96	-0.17		
New York City.	Nov. 1, 1870	2.68	+2.39	3.36	+1.73	4.09	+0.34	3.21	-0.55	2.86	+1.49		
Philadelphia, Pa.	Jan. 1, 1871	3.41	+2.05	3.20	+2.50	3.38	+1.32	3.04	-1.41	2.83	+0.56		
Atlantic City, N. J.	Dec. 10, 1873	3.08	+3.19	3.46	+3.06	4.13	+1.66	2.66	+0.32	2.28	-0.66		
Barnegat City, N. J.	Dec. 10, 1873	4.99	+0.26	3.71	-2.60	5.06	-0.68	3.81	-2.84	2.64	-1.35		
Cape May, N. J.	May 24, 1871	4.32	+1.24	3.80	+2.42	5.18	+0.43	3.20	-0.92	2.51	-1.32		
Sandy Hook, N. J.	Dec. 10, 1873	4.30	+2.46	3.51	+1.21	5.39	-1.07	4.55	-1.40	4.09	-0.18		
Delaware Breakwater, Del.	Jan. 28, 1880	4.07	+0.12	3.23	-2.91	4.07	+0.04	4.78	+0.04	1.35	-0.47		
Baltimore, Md.	Jan. 1, 1871	3.12	+1.63	3.29	+3.40	4.11	+2.26	3.19	-0.52	2.84	+0.33		
Washington City	Nov. 1, 1870	3.34	+2.25	3.14	+3.70	4.27	+2.97	2.99	-1.13	2.90	+0.10		
Cape Henry, Va.	Dec. 15, 1873	5.11	+3.52	5.59	-0.28	6.19	+1.46	5.49	-2.60	3.19	-2.41		
Chincoteague, Va.	Mar. 16, 1880	4.62	+0.27	4.23	+1.61	4.45	+3.86	2.89	-0.88	1.97	-0.85		
Lynchburg, Va.	May 24, 1871	4.05	+4.43	3.44	+5.58	4.05	+4.09	3.53	-1.20	2.88	-0.44		
Norfolk, Va.	Jan. 1, 1871	4.04	+1.90	3.90	+0.68	4.09	+4.44	4.12	-2.17	3.87	-2.12		
South Atlantic States:													
Charlotte, N. C.	Oct. 6, 1878	6.10	-1.50	4.65	+1.78	5.66	+3.53	4.84	+0.56	2.80	+2.64		
Hatteras, N. C.	Dec. 1, 1880	6.50	+1.14	5.25	-0.07	7.64	-2.00	5.78	-2.27	3.96	-1.23		
Kitty Hawk, N. C.	Jan. 15, 1875	6.13	+0.87	3.75	+0.57	6.81	+2.86	5.70	-0.93	2.98	-1.17		
Macon, Fort. N. C.	May 23, 1878	5.98	-0.25	3.10	-0.76	6.08	-1.98	4.25	-1.78	3.48	-0.10		
Smithville, N. C.	Oct. 15, 1875	4.00	-0.56	3.08	-0.20	4.16	-1.36	3.48	-1.11	2.71	-1.29		
Wilmington, N. C.	Jan. 1, 1871	8.95	+1.27	3.45	+0.85	4.46	+0.61	3.36	-0.91	4.13	-0.43		
Charleston, S. C.	Jan. 5, 1871	3.92	+1.97	3.69	+0.60	4.46	+0.07	4.92	-1.47	4.52	-2.34		
Augusta, Ga.	Nov. 2, 1870	4.48	-0.14	3.96	+0.00	5.74	+1.23	4.52	-0.84	3.14	+0.67		
Savannah, Ga.	Jan. 1, 1871	3.44	+0.45	3.14	+0.30	4.12	-0.79	4.78	-1.00	2.88	-1.66		
Jacksonville, Fla.	Sept. 11, 1871	3.89	+1.39	3.37	-0.92	3.09	-0.46	3.46	-1.14	3.92	-1.58		
Florida Peninsula:													
Cedar Keys, Fla.	Nov. 7, 1879	5.26	-0.18	2.70	-1.14	3.31	-1.10	2.98	+0.60	2.57	-0.61		
Key West, Fla.	Nov. 1, 1870	2.28	-0.46	1.83	-0.13	0.63	-0.47	1.89	-0.41	4.08	-1.73		
Sanford, Fla.	Sept. 1, 1882	1.20	-0.29	2.20	+0.20	1.22	-0.28	5.17	-3.27	2.72	-0.49		
Eastern Gulf States:													
Atlanta, Ga.	Sept. 25, 1878	7.15	-1.95	5.99	-0.15	7.17	+2.54	5.82	+0.04	2.72	-1.39		
Pensacola, Fla.	Oct. 27, 1879	5.08	-1.39	4.48	-1.05	4.37	+1.35	5.00	+0.67	4.97	+1.67		
Mobile, Ala.	Nov. 7, 1870	4.94	+2.46	4.58	+0.43	7.88	+3.65	6.02	-0.48	4.96	+2.32		
Montgomery, Ala.	Nov. 9, 1870	4.58	+0.24	5.51	-0.71	6.77	+2.78	6.46	-3.38	3.71	-2.33		
Vicksburg, Miss.	Sept. 10, 1871	5.50	+2.70	5.82	+1.41	6.94	+1.85	6.92	-2.45	5.69	+6.07		
New Orleans, La.	Nov. 1, 1870	5.44	-1.09	4.27	-1.11	5.93	+2.81	6.35	+0.13	5.53	-1.19		
Western Gulf States:													
Shreveport, La.	Sept. 8, 1871	4.75	-0.20	5.20	+0.29	5.02	-0.24	6.01	+0.59	5.23	+9.21		
Fort Smith, Ark.	June 1, 1882	2.03	-0.68	8.17	+2.55	1.74	+0.54	3.48	-0.96	4.68	-0.29		
Little Rock, Ark.	July 1, 1879	4.75	-1.30	8.66	+1.18	0.03	-0.36	6.28	+3.96	7.07	+0.25		
Galveston, Tex.	Apr. 19, 1871	3.89	+1.22	2.92	-2.03	3.14	+1.70	1.24	+2.31	4.45	+2.87		
Indianola, Tex.	May 1, 1872	1.96	-1.25	1.83	-1.79	2.00	-0.69	1.58	+0.38	3.36	+4.53		
Palestine, Tex.	Dec. 3, 1881	3.05	-0.74	3.39	-0.92	3.78	-0.16	4.75	+2.55	9.22	+8.63		
Rio Grande Valley:													
Brownsville, Tex.	Aug. 25, 1875	1.99	-0.89	1.66	-1.69	1.22	-1.15	0.65	-0.06	3.22	+2.84		
Rio Grande City, Tex.	May 28, 1875	1.05	-0.58	1.06	-1.06	1.12	-0.99	0.88	+0.03	2.75	+2.40		
Ohio Valley and Tennessee:													
Chattanooga, Tenn.	Jan. 8, 1879	7.93	-2.05	5.70	+3.11	7.00	+3.19	5.84	+0.11	3.56	-1.35		
Knoxville, Tenn.	Jan. 1, 1871	5.94	+0.72	5.16	+3.35	5.93	+6.00	5.78	-1.34	3.25	-1.63		
Memphis, Tenn.	Feb. 28, 1871	5.90	-0.24	5.89	-3.84	0.17	-1.09	6.03	+1.97	4.86	+1.00		
Nashville, Tenn.	Nov. 1, 1870	5.16	+2.04	5.58	+2.60	5.46	+3.43	6.06	-2.15	5.38	+6.05		
Louisville, Ky.	Sept. 11, 1871	4.06	-2.12	4.86	+4.96	4.37	-0.61	4.57	-1.06	3.93	+1.82		
Indianapolis, Ind.	Feb. 10, 1871	2.79	-1.74	3.77	+0.96	4.14	-0.13	3.45	-0.56	2.40	+5.50		
Cincinnati, Ohio	Nov. 1, 1870	3.45	-1.24	4.06	+4.79	3.86	-1.23	3.22	-0.20	3.65	+1.91		

APPENDIX 27.

United States Army, for each month of the year. (The normal has been computed from the to December, 1884, inclusive.)

June.		July.		August.		September.		October.		November.		December.	
Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -
Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.
4.10	-1.92	5.12	+3.36	3.26	+1.15	3.64	-1.75	4.56	-2.68	4.72	+1.23	3.84	+4.79
3.48	-2.07	3.70	+3.08	3.38	+0.60	2.97	-2.41	3.56	-1.85	3.74	-1.49	3.14	+3.28
9.45	-1.37	10.90	+13.00	7.63	+1.00	8.90	-1.38	7.35	+5.56	6.62	+1.37	5.40	-0.70
3.65	+0.36	3.93	+0.32	4.37	+0.64	3.07	-2.76	4.18	-1.01	5.06	-2.03	3.63	+0.83
2.85	-0.06	4.15	+1.22	3.39	+1.91	2.56	-1.79	3.79	-0.93	6.36	-3.69	4.15	+1.67
4.98	-2.39	3.82	+2.70	3.48	+2.93	3.40	-2.78	5.01	-1.12	4.37	+1.56	4.61	+1.95
3.36	+1.90	4.94	+0.95	5.62	-0.02	3.92	-2.51	3.74	-1.25	4.00	-1.76	3.61	+2.80
3.57	+2.72	4.54	+1.48	5.19	+1.94	3.38	-2.06	4.17	-1.64	4.12	-1.34	3.52	+3.84
4.08	-2.28	4.53	+0.51	3.35	+1.92	3.48	-1.68	3.08	-0.44	2.57	+0.87	2.75	+0.45
3.38	+0.78	4.58	+1.56	4.90	+3.06	3.61	-3.49	3.16	+0.47	3.35	+0.09	3.21	+3.45
3.58	-0.58	4.67	+0.54	4.99	-0.69	3.47	-3.27	2.86	-1.32	3.20	-0.89	2.60	+0.68
3.24	+0.26	3.15	+1.58	5.12	-1.08	3.50	-3.16	2.81	+0.13	3.44	+0.59	4.36	+3.35
3.77	-1.53	4.04	+0.31	4.87	+0.17	5.05	-4.00	3.46	-1.27	4.23	-1.55	4.57	+2.52
3.61	-2.58	3.38	+1.06	5.73	-0.43	4.16	-3.85	3.37	-2.04	6.33	-1.33	4.34	+2.53
4.36	-0.16	4.38	+2.04	4.71	+0.41	4.70	-4.67	3.41	+0.80	4.07	-0.50	3.88	+1.76
2.37	-1.00	2.68	-0.56	3.69	+0.50	2.31	-1.32	2.68	-1.56	2.28	+0.14	2.56	+0.66
3.84	-1.33	4.44	+4.99	4.26	-2.52	4.03	-3.94	2.86	-1.44	3.04	+0.05	3.17	+0.74
4.42	+2.53	4.32	+3.07	4.68	-3.67	4.11	-3.97	2.91	-1.18	2.88	+0.54	3.04	+1.66
3.76	-1.24	6.17	+1.47	5.13	-2.57	5.23	-4.81	3.93	-3.19	4.11	-3.53	4.39	-0.90
2.47	+1.13	4.01	+0.91	4.35	-3.25	2.50	-2.17	3.12	-2.00	2.89	-0.77	4.07	+1.68
3.46	+0.70	3.06	-0.74	4.15	-1.30	3.46	-2.22	2.85	-2.31	3.35	+0.28	3.91	+7.90
4.31	+2.14	5.51	+1.55	5.88	-2.93	4.87	-4.70	3.71	-3.24	3.37	-2.63	3.84	+0.52
4.21	+5.26	5.77	+2.13	4.67	-2.59	3.23	+0.34	3.23	-1.72	4.06	+0.67	5.25	+0.47
4.73	-2.22	6.64	+3.87	6.24	-0.35	7.35	-6.34	6.69	-5.46	6.28	+6.74	6.42	+0.99
4.73	-0.16	7.19	+3.57	7.90	-1.32	6.08	-5.93	4.38	-3.15	5.26	+1.88	5.24	+0.41
5.44	-3.81	6.69	-2.33	6.17	+0.69	7.48	-1.92	3.31	-2.97	2.80	+0.26	4.38	+1.02
3.38	-1.07	6.27	+1.05	5.51	-0.13	6.46	-3.35	5.26	-5.03	3.02	-1.21	3.51	-0.58
0.07	+1.87	6.38	+1.91	8.05	+1.53	7.78	+1.56	3.76	-3.13	3.75	-0.79	3.65	+0.07
5.28	+2.97	7.35	+2.17	7.36	-1.24	6.77	+4.26	4.67	-4.32	3.36	-1.87	3.62	-0.36
4.13	+0.19	4.43	-1.18	4.84	-0.48	3.98	+0.26	2.13	-1.30	4.10	-2.39	3.94	+0.25
6.92	+2.45	4.86	-1.18	7.67	+0.74	5.24	-0.69	3.69	-1.40	2.54	-0.82	3.42	-0.21
5.50	+1.39	5.25	+0.77	7.04	-1.83	7.15	-1.47	6.43	-2.31	3.12	+2.31	2.98	+1.06
6.15	+0.53	8.48	-2.46	9.47	-1.36	5.52	-1.89	3.35	-3.22	2.85	+0.21	3.22	+2.44
4.09	+0.47	4.13	-1.77	5.25	-2.09	6.60	+0.48	5.68	-2.51	2.52	+3.51	1.83	-0.15
9.07	+0.50	4.36	+1.21	8.92	+2.17	3.63	+0.20	5.70	-2.68	0.90	+0.55	1.83	+1.18
4.25	+6.48	3.26	-0.84	3.85	-1.79	2.73	-2.65	2.46	-1.76	4.67	-1.83	6.02	+0.07
5.63	+2.21	6.42	+2.97	10.48	-8.41	6.73	-1.90	4.28	-1.85	4.51	+0.65	5.36	+0.24
5.62	+1.39	6.48	-1.52	7.08	-5.82	5.03	-3.25	3.84	+1.52	4.32	-0.20	4.74	+0.36
4.78	+5.48	3.65	-0.85	3.36	-0.31	2.77	-2.19	2.59	-0.72	3.56	-0.89	5.41	-1.41
3.80	-0.66	4.14	-1.61	3.43	-1.27	4.14	+0.98	3.52	-2.44	5.79	-3.51	5.87	+7.65
6.22	+2.38	6.60	-2.48	5.62	-4.75	4.30	-1.18	3.57	+2.03	5.41	-2.28	5.66	+2.95
3.22	+1.00	3.94	-3.88	2.01	-0.02	4.21	-2.11	3.68	+3.14	4.93	+0.80	5.42	+10.13
2.88	-0.47	4.00	+1.98	2.13	+1.60	4.39	+0.64	4.54	-3.22	4.05	+1.14	3.71	+2.59
3.28	-1.10	3.69	+0.54	3.85	-0.59	3.16	+1.84	3.44	-2.14	4.90	-2.07	5.17	+11.75
4.26	+2.58	3.60	-2.44	5.35	-3.58	6.25	+0.79	5.75	+1.62	5.20	-0.95	4.96	+4.48
2.74	+4.82	2.41	-2.08	4.13	-2.85	6.75	+2.85	3.94	+4.00	3.10	-0.25	3.22	-1.17
3.27	-0.62	2.62	-2.56	2.09	-1.43	2.75	+1.25	5.29	-3.84	6.22	-3.29	3.68	+3.26
1.85	+0.89	2.36	-2.13	4.87	-3.99	5.85	+3.11	4.69	+11.02	2.53	+0.93	2.21	-0.88
1.35	-1.33	1.58	-1.58	4.44	-4.44	3.06	+4.24	2.45	+2.00	0.86	-0.83	1.38	-1.05
4.29	+4.91	3.63	+1.16	4.26	-1.72	3.74	-1.74	3.27	-1.44	4.64	-2.89	6.00	+0.80
4.46	+0.87	4.59	+4.00	4.26	+0.49	2.92	-2.26	2.94	-0.89	4.17	-2.86	4.48	+1.63
5.32	+1.94	2.84	-0.46	3.15	-1.88	2.96	+1.33	3.75	-0.92	4.52	-2.44	4.07	+5.07
4.20	-2.33	5.00	-1.82	3.42	-0.61	3.34	-0.98	3.02	-0.59	3.89	-2.32	3.84	-0.06
4.49	-0.90	4.39	-0.45	3.56	+1.25	2.79	+3.11	3.40	-1.40	3.50	-1.73	4.52	+0.59
5.45	-1.34	5.80	+0.23	3.10	-2.64	2.62	+0.47	3.38	-1.07	3.72	-2.26	3.52	+2.53
6.79	-2.02	4.10	-2.37	4.02	-1.97	2.29	+1.58	2.98	-1.03	3.32	-2.09	3.98	+0.01

Normal precipitation and departure (of 1884)

Stations.	Established.	January.		February.		March.		April.		May.			
		Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -		
Ohio Valley and Tennessee—													
Continued:													
Columbus, Ohio	July 1, 1878	3.09	-0.84	4.11	+0.84	3.62	-0.03	2.96	-0.87	4.51	-0.72		
Pittsburg, Pa.	Nov. 1, 1870	3.02	+1.80	2.54	+2.03	3.09	+0.62	2.48	-1.37	2.75	+0.73		
Lower Lakes:													
Buffalo, N. Y.	Nov. 1, 1870	2.66	+0.70	2.54	+1.49	2.98	-0.12	2.36	-6.80	2.99	+0.93		
Oswego, N. Y.	Nov. 1, 1870	3.16	+3.33	2.58	+0.40	3.24	-0.57	2.00	-1.12	2.78	-0.39		
Rochester, N. Y.	Nov. 1, 1870	3.44	+1.09	2.62	-0.68	3.40	-0.10	2.52	-1.58	3.23	-0.95		
Erie, N. Y.	May 25, 1873	3.44	+1.15	3.37	+2.51	3.19	+0.63	2.52	-0.53	3.55	-0.13		
Cleveland, Ohio.	Nov. 1, 1870	2.43	+0.82	2.81	+2.46	3.07	-0.20	2.44	-0.69	3.20	+0.49		
Sandusky, Ohio.	Aug. 2, 1877	2.05	-0.80	3.47	+2.01	2.95	+0.31	2.12	-1.08	3.40	+0.39		
Toledo, Ohio.	Nov. 1, 1870	2.09	+0.52	2.02	-1.01	2.26	-0.17	2.27	-0.70	3.20	+0.51		
Detroit, Mich.	Nov. 1, 1870	2.13	-0.05	2.48	+0.91	2.82	-0.72	2.31	-0.77	3.63	-1.25		
Upper Lakes:													
Alpena, Mich.	Sept. 10, 1872	2.12	+0.95	2.15	+0.63	2.03	-0.42	1.82	-1.07	3.94	-0.67		
Escanaba, Mich.	May 24, 1871	1.28	-0.73	1.40	+1.35	1.71	-0.61	1.84	+0.76	3.93	-1.24		
Grand Haven, Mich.	May 24, 1871	2.31	+0.52	2.14	+0.58	2.61	+1.25	2.72	+1.11	3.60	-0.01		
Mackinaw City, Mich.	Aug. 20, 1882	6.63	+1.40	4.04	+1.06	1.36	-0.15	0.84	+0.15	0.38	-0.41		
Marquette, Mich.	May 1, 1871	1.15	-0.24	1.40	+0.65	1.34	-0.60	1.70	+2.24	2.98	-0.75		
Port Huron, Mich.	July 25, 1874	1.92	-0.29	2.40	+0.76	3.80	+2.02	2.25	+0.33	1.30	-1.39		
Chicago, Ill.	Nov. 1, 1870	1.99	-0.60	2.35	+0.92	2.96	+2.20	3.60	-0.55	3.86	-2.13		
Milwaukee, Wis.	Nov. 1, 1870	1.96	-0.27	1.97	+0.64	2.82	-0.05	3.01	+0.14	3.65	-1.94		
Duluth, Minn.	Nov. 1, 1870	1.01	-0.34	1.15	+1.56	1.65	-0.33	2.16	+1.48	4.03	-1.14		
Upper Mississippi Valley:													
Saint Paul, Minn.	Nov. 1, 1870	1.03	-0.53	1.08	+0.19	1.62	-0.28	2.09	-0.09	3.60	-1.51		
La Crosse, Wis.	Oct. 15, 1872	1.17	-0.64	1.18	+0.24	1.80	-0.69	2.04	+1.03	3.43	-0.61		
Davenport, Iowa.	May 24, 1871	1.67	-0.92	1.57	-0.59	2.36	+0.01	3.07	-2.30	4.46	-0.67		
Des Moines, Iowa.	Aug. 1, 1878	1.02	-0.17	1.73	+0.19	1.54	-0.70	2.64	+0.33	6.17	-1.85		
Dubuque, Iowa.	July 10, 1873	1.43	-0.44	1.59	+0.60	2.44	+1.12	2.91	-0.14	4.01	+0.87		
Keokuk, Iowa.	July 16, 1871	1.60	-0.75	1.75	+0.13	2.38	-0.99	3.10	-1.79	4.19	-1.69		
Cairo, Ill.	June 1, 1871	4.24	-1.92	4.56	+1.24	4.19	-0.01	4.32	-0.67	4.28	+0.29		
Springfield, Ill.	July 1, 1879	1.90	-0.39	5.69	+1.45	3.36	+0.34	3.19	-0.70	5.92	-2.13		
Saint Louis, Mo.	Nov. 1, 1870	2.09	-1.30	3.20	+1.23	3.04	-0.04	3.41	+0.74	2.78	-1.10		
Missouri Valley:													
Leavenworth, Kans.	May 21, 1871	1.32	-0.35	1.58	-0.16	2.49	+1.21	3.65	+1.09	5.05	-0.26		
Omaha, Nebr.	Nov. 1, 1870	0.56	+0.17	0.85	+0.57	1.58	+3.33	3.35	+0.53	5.02	-3.57		
Bennett, Fort, Dak.	Dec. 22, 1879	0.88	-0.57	0.74	+0.17	1.23	-0.15	2.28	+0.72	6.62	+0.77		
Huron, Dak.	July 1, 1881	0.13	-0.04	0.43	+0.15	0.92	+0.61	3.01	-0.31	9.95	-1.05		
Yankton, Dak.	April 1, 1873	0.58	-0.33	0.88	+0.92	1.20	-0.26	3.10	+2.63	4.58	-3.43		
Extreme Northwest:													
Moorhead, Minn.	Jan. 1, 1881	0.92	-0.37	1.25	+0.07	1.22	-0.19	1.34	-0.11	3.36	-1.61		
Saint Vincent, Minn.	Sept. 5, 1880	0.34	-0.20	0.47	-0.23	0.56	-0.16	0.81	-0.01	2.54	-1.43		
Bismarck, Dak.	Sept. 15, 1874	0.56	-0.18	0.68	+0.19	1.15	-0.55	2.86	-0.66	3.23	-0.67		
Buford, Fort, Dak.	Oct. 23, 1878	0.74	-0.63	0.50	-0.38	0.52	-0.42	1.28	+0.04	2.15	-2.01		
Northern Slope:													
Assinaboine, Fort, Mont.	Oct. 6, 1879	1.28	-1.12	0.52	-0.08	0.77	-0.24	0.89	-0.64	1.49	+1.56		
Benton, Fort, Mont.	Oct. 11, 1879	0.80	-0.34	0.50	(¹)	0.77	(¹)	0.87	(¹)	2.83	-1.74		
Custer, Fort, Mont.	Dec. 5, 1878	1.33	+1.52	0.50	+0.79	0.53	+0.49	1.17	-0.40	3.21	-2.62		
Helena, Mont.	Oct. 15, 1879	2.06	+1.69	0.74	+0.50	0.41	+0.18	1.26	-0.20	1.11	-0.48		
Maginnis, Fort, Mont.	July 14, 1882	1.38	+0.09	0.64	+0.05	1.01	-0.45	0.50	+0.12	2.14	-0.48		
Poplar River, Mont.	May 1, 1882	0.38	-0.07	0.42	-0.01	0.54	(¹)	0.76	+0.15	1.71	-0.93		
Shaw, Fort, Mont.	April 1, 1880	1.17	-0.31	0.40	+0.36	0.56	-0.14	0.71	-0.12	1.67	-0.93		
Deadwood, Dak.	Dec. 25, 1877	0.92	-0.07	0.95	+0.06	1.78	+0.83	3.05	-2.76	5.44	-3.72		
Cheyenne, Wyo.	Nov. 1, 1870	0.27	+0.49	0.14	+0.12	0.56	+1.03	1.06	+0.27	2.33	+2.50		
North Platte, Nebr.	Sept. 18, 1874	0.60	+0.50	0.39	-0.16	0.64	+1.18	1.84	+0.30	3.09	-0.68		
Middle Slope:													
Denver, Colo.	Nov. 19, 1871	0.66	-0.44	0.46	+0.40	0.87	+0.08	1.83	+1.50	3.17	+1.44		
Pike's Peak, Colo.	Nov. 1, 1873	1.61	-1.51	1.28	-0.52	1.98	-1.59	3.32	-2.89	4.01	-1.11		
West Las Animas, Colo.	Oct. 1, 1881	0.20	+0.06	0.35	+0.15	0.48	+0.70	1.09	+0.06	3.67	+0.79		
Dodge City, Kans.	Sept. 15, 1874	0.26	-0.18	0.55	-0.27	0.82	+1.09	1.24	-0.17	4.35	+0.12		
Elliott, Fort, Tex.	Nov. 29, 1879	0.28	+0.33	0.35	-0.08	0.26	+0.08	0.80	+0.28	5.62	+0.67		
Southern Slope:													
Concho, Fort, Tex.	Oct. 10, 1875	1.12	+0.14	1.24	-0.76	1.24	-0.48	1.98	+3.66	4.51	+8.99		
Davis, Fort, Tex.	Dec. 24, 1877	0.62	-0.14	0.17	-0.10	0.27	+0.01	0.60	+1.03	1.54	-0.46		
Stockton, Fort, Tex.	Feb. 26, 1870	0.28	-0.07	0.83	+0.05	0.58	-0.46	0.42	+0.49	1.39	+0.27		
Southern Plateau:													
El Paso, Tex.	Nov. 5, 1877	0.70	-0.15	0.52	+0.32	0.55	-0.22	0.23	+0.68	0.32	-0.73		
Apache, Fort, Ariz.	Oct. 9, 1877	1.29	-0.61	2.00	+1.43	1.81	+2.63	0.82	+0.85	0.58	+0.73		
Grant, Fort, Ariz.	Nov. 1, 1875	0.78	+0.34	1.29	+3.33	1.42	+2.45	0.25	+0.22	0.43	+0.38		
Phoenix, Ariz.	Aug. 18, 1876	0.56	-0.40	0.99	+1.47	0.83	+1.31	0.37	+0.03	0.08	-0.07		
Prescott, Ariz.	Nov. 19, 1873	1.08	-0.83	1.45	+5.10	1.41	+4.10	0.92	+0.70	0.57	+0.88		
San Carlos Agency, Ariz.	June 1, 1881	1.28	-0.28	2.28	+1.55	1.74	+2.23	2.08	-0.56	0.52	-0.20		
Thomas, Camp, Ariz.	Sept. 22, 1877	0.51	-0.06	1.40	+1.54	1.61	+1.60	0.29	+0.43	0.39	+0.21		
Verde, Fort, Ariz.	Nov. 9, 1874	0.72	-0.33	0.99	+2.60	1.36	+2.24	0.89	+0.54	0.37	+0.15		
Wickenburg, Ariz.	Jan. 6, 1874	1.00	-0.81	1.20	+3.01	0.84	+2.83	0.52	+0.72	0.26	+0.78		
Yuma, Ariz.	Nov. 18, 1873	0.38	-0.38	0.64	+0.94	0.24	+1.24	0.09	-0.02	0.06	+0.28		

¹ Record incomplete.

therefrom at stations of the Signal Service, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.	
Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -
Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.	Inch.	Inches.
3.81	-1.22	3.71	-1.55	3.58	-2.88	2.47	+0.99	3.52	-1.86	3.34	-2.35	3.80	-1.03
3.57	-1.86	3.81	-0.77	3.16	-0.22	2.65	-1.48	2.55	-0.53	2.44	-1.26	3.01	+1.06
3.15	-0.35	3.67	+1.44	2.91	+1.65	3.04	-1.27	3.80	-2.26	3.48	-0.97	3.40	-0.33
3.34	-1.86	3.27	-1.37	2.45	-0.74	2.48	-0.56	3.47	-0.26	3.26	-1.17	3.66	-1.05
3.25	+1.07	3.48	-0.45	3.01	-0.49	2.32	-0.42	3.25	-1.38	2.81	-1.49	3.04	-0.42
3.95	-1.55	3.47	+1.82	3.02	-0.86	4.32	-0.40	4.24	-1.01	4.46	+0.45	3.44	+0.40
4.25	-0.96	4.28	+0.85	3.29	-1.64	3.00	-0.14	3.05	-1.08	2.56	-0.97	2.76	-0.03
4.62	-2.20	4.34	-1.41	4.04	-1.56	3.50	-0.83	3.21	-2.03	3.34	-2.33	2.91	-0.47
3.70	-1.00	3.76	-0.10	2.00	-1.43	2.45	-1.43	2.74	-0.60	2.86	-1.47	2.49	-0.46
3.80	-1.88	4.12	-0.36	2.83	-1.28	2.68	+0.02	2.80	-0.84	2.50	-0.76	2.80	+0.25
4.04	-1.37	3.54	-1.18	3.45	-0.76	4.66	+0.17	4.68	-0.93	2.88	-0.73	2.33	+3.25
4.79	-2.27	3.44	-0.43	4.11	-0.60	4.39	+4.38	3.98	-3.99	2.62	-0.48	1.72	+2.62
1.54	-0.72	3.41	+0.60	2.67	-3.57	3.92	+0.23	4.03	+2.07	3.29	-0.68	2.57	+4.23
2.91	-0.64	3.43	-0.92	2.62	+0.66	2.18	-0.22	3.20	+0.65	3.43	-0.54	5.21	+1.27
4.13	-2.92	3.75	-0.90	3.14	+2.32	5.23	-0.32	3.82	+2.09	2.33	+0.44	2.10	+6.55
3.64	-1.01	2.94	-0.90	2.08	-1.50	2.48	-0.61	3.23	-1.63	2.67	-0.33	2.42	+0.59
4.28	-2.17	3.43	-0.23	2.75	-0.15	2.78	-0.49	3.84	-0.25	2.88	-1.08	2.22	+1.90
1.07	+0.15	3.39	+0.41	2.79	-0.05	3.12	-0.30	2.80	-0.62	2.13	-0.68	1.83	-0.51
5.37	+4.24	4.10	-0.63	3.56	+3.36	4.58	+0.12	3.14	+0.83	1.75	-0.80	1.38	-0.16
5.02	-1.45	5.20	-0.27	3.76	-0.87	3.35	+1.13	2.23	+0.20	1.37	-0.72	1.33	+0.65
4.73	-1.79	5.02	-0.44	3.65	+0.17	5.12	+4.89	2.79	+0.47	1.09	-0.54	1.28	+0.97
4.99	-1.92	3.93	+0.58	3.60	-0.24	3.29	+1.50	3.11	+4.00	2.11	-0.62	1.69	+1.99
5.39	-4.55	4.00	+3.16	3.71	-0.13	3.19	+2.27	4.72	+0.61	2.59	-1.33	1.54	+0.39
5.65	-0.76	5.30	+0.00	3.50	-0.75	4.89	-0.82	3.20	+0.96	2.33	-0.90	1.70	+2.28
5.51	-1.48	4.67	-2.37	2.88	-0.14	3.64	+0.61	3.56	-0.21	2.09	-0.36	2.25	+1.66
4.52	-1.57	4.27	+3.07	2.78	-0.04	2.57	-2.45	3.31	-1.42	4.02	-1.61	3.73	+5.26
6.95	-0.75	2.66	+0.96	2.54	-1.00	3.20	+3.60	4.32	-1.58	3.50	-2.20	3.38	+1.81
4.90	-0.28	2.45	-1.39	2.47	-1.26	2.20	+3.24	2.75	-0.27	2.69	-0.39	2.45	+3.73
5.71	-2.38	5.12	+4.31	3.30	+1.35	3.26	+2.12	3.37	+0.04	2.48	-1.06	1.72	-0.24
6.73	-0.62	5.95	+4.40	3.53	+3.54	3.60	+1.31	3.10	+2.71	1.36	-1.04	1.00	-0.28
3.35	-0.45	2.33	+1.46	1.80	-0.56	1.19	-0.51	0.80	+0.10	0.29	-0.12	0.45	+0.01
4.46	-1.28	4.94	+0.17	2.68	-1.50	1.73	-0.47	2.24	-0.72	0.32	-0.15	0.38	+0.24
5.11	-3.39	4.14	+0.49	2.59	+0.02	2.73	-2.45	1.80	+0.17	0.35	-0.33	0.76	+0.04
2.30	-1.96	4.70	+2.62	4.43	+1.74	2.74	-0.25	3.43	+0.27	1.11	-0.77	0.95	-0.19
2.62	+0.01	2.48	+0.99	3.68	+3.50	2.14	+1.30	2.73	-1.58	0.45	-0.03	0.56	+0.29
3.64	-0.01	2.35	+1.27	2.82	+0.98	1.44	+0.90	1.30	-0.88	0.71	+0.02	0.81	+0.90
2.68	+1.69	2.49	-0.62	1.14	-0.08	0.87	+0.34	0.95	-0.51	0.36	-0.05	0.98	-0.58
2.18	+2.54	3.66	+5.99	1.99	+0.62	1.51	+1.18	0.65	-0.24	1.11	-0.69	0.80	-0.08
1.85	+0.33	1.81	+1.28	1.04	-0.25	1.10	+0.34	0.84	-0.48	0.79	-0.50	0.66	+0.35
2.51	+1.36	1.21	-0.41	1.16	+0.93	0.75	+0.67	0.99	-0.33	0.50	-0.13	1.06	-0.79
2.74	+2.05	1.35	+1.90	0.94	-0.47	1.86	-0.56	1.22	-0.73	0.68	-0.22	1.62	-0.06
1.08	+0.13	0.46	+0.18	0.77	+0.56	0.55	-0.29	1.73	-1.40	0.01	-0.30	0.75	+0.07
0.95	+0.72	1.39	+2.01	0.83	-0.15	0.81	-0.17	1.16	-0.70	0.33	+0.10	0.28	-0.06
2.23	-1.26	1.49	+1.17	0.92	-0.33	1.78	+0.51	1.04	-0.65	0.60	+0.15	0.94	+1.53
4.10	-1.59	2.50	+1.01	1.96	+1.11	0.80	+1.19	1.54	-0.08	1.07	+0.39	1.55	+0.24
1.42	+0.08	1.71	-1.11	1.47	+0.60	0.80	+0.36	0.75	-0.25	0.26	-0.08	0.21	+0.46
3.72	-2.33	2.96	-0.77	2.29	-0.16	1.40	-1.32	1.33	-0.59	0.32	-0.28	0.75	-0.48
1.59	-0.12	1.79	-1.14	1.56	+0.15	0.90	-0.77	0.74	-0.53	0.70	-0.51	0.71	+0.05
1.83	-0.89	4.53	-4.12	4.16	-3.91	1.93	-1.44	1.40	-0.50	1.94	-1.82	1.26	+0.24
2.64	+0.15	1.87	+0.38	1.57	+0.60	0.47	-0.41	0.46	-0.03	0.18	+0.14	0.83	-0.11
3.06	+4.61	3.40	+3.00	3.45	+1.37	1.07	-0.84	1.24	+0.16	0.66	+0.17	0.72	+0.38
2.93	+3.93	3.04	-1.75	3.18	+2.42	2.54	-1.70	3.25	+2.29	0.73	+1.41	0.83	+2.22
2.44	-0.35	3.70	-1.33	3.75	-2.55	4.36	-0.76	2.99	+2.50	1.31	+0.64	1.47	+2.10
2.40	+0.28	3.73	-3.38	5.55	+1.13	2.16	+1.58	2.35	+2.00	0.53	+0.10	0.41	+0.07
2.66	+0.78	2.06	-1.54	2.76	-0.01	5.74	+0.10	1.62	+4.63	0.77	+0.05	0.70	+0.57
0.11	+0.00	3.29	-2.83	2.54	+1.44	1.36	+2.32	1.58	+3.57	0.50	-0.28	0.80	+1.27
1.02	+1.33	4.09	-4.16	5.00	+0.59	1.77	-0.27	1.88	+0.14	0.97	-0.15	2.26	+3.20
0.81	+0.39	3.68	-3.61	3.55	-1.14	1.28	-0.30	1.04	+2.02	0.54	-0.01	1.84	+4.09
0.13	+0.02	0.94	-0.87	1.12	+0.72	0.81	+0.69	0.27	+0.85	0.48	-0.24	1.49	+1.45
0.17	+0.15	2.13	-0.80	3.28	-1.71	1.25	+0.26	0.60	+0.82	0.50	-0.34	2.04	+3.54
0.40	+0.09	2.24	-1.87	3.58	-2.34	0.86	-0.03	0.89	+0.60	0.55	+0.00	2.28	+3.20
0.47	+0.03	1.63	-1.27	2.40	-2.36	0.66	+0.25	0.36	+0.33	0.34	+0.22	1.67	+3.49
0.21	+0.08	1.90	-1.71	3.30	-0.06	1.27	-0.59	0.56	+0.28	0.58	-0.43	1.93	+2.73
0.02	+0.04	0.88	-0.60	1.97	-0.95	0.75	-0.52	0.18	+0.15	0.42	-0.39	1.85	+3.42
0.01	-0.01	0.20	-0.19	0.26	+0.06	0.08	-0.08	0.04	-0.04	0.03	-0.03	0.49	+1.47

Normal precipitation and departure (of 1884)

Stations.	Established.	January.		February.		March.		April.		May.	
		Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -
Middle Plateau:		In.	Inch.	In.	Inch.	In.	Inch.	In.	Inch.	In.	Inch.
Salt Lake City, Utah	Mar. 19, 1874	1.33	-0.63	1.37	+0.86	2.01	+1.63	2.44	+0.45	2.14	-0.26
Northern Plateau:											
Boisé City, Idaho	July 1, 1877	2.43	-0.68	1.76	-0.44	1.49	+1.29	1.19	-0.41	1.02	-0.10
Cœur d'Alene, Fort, Idaho.	Sept. 1, 1881	2.86	+0.16	1.77	-0.43	0.76	+0.09	1.95	-0.59	1.78	-1.12
Lewiston, Idaho	July 1, 1879	2.30	-0.34	1.53	+1.25	1.18	+0.07	1.81	+0.14	1.00	-0.59
Dayton, Wash	July 1, 1879	3.92	-0.78	4.04	+1.62	1.98	-0.20	3.09	-0.69	1.77	-0.95
Spokane Falls, Wash	Feb. 5, 1881	3.82	-1.03	3.03	+0.02	1.10	+0.44	1.82	-0.49	1.18	-0.62
North Pacific Coast:											
Olympia, Wash	July 1, 1877	8.80	-3.33	9.74	-5.57	5.53	-3.96	4.24	-0.64	2.58	-1.12
Portland, Oreg.	Nov. 1, 1871	7.06	-3.30	7.86	-2.98	6.88	-4.63	3.49	+0.08	3.25	-1.01
Roseburg, Oreg.	July 15, 1877	6.47	-2.81	4.75	-1.04	3.95	-0.58	3.00	+0.48	1.77	-0.92
Little Pacific Coast:											
Cape Mendocino, Cal	July 27, 1883	2.09	-0.83	2.40	+0.45	2.60	+0.92	3.18	+0.023	1.00	-0.67
Red Bluff, Cal	July 1, 1877	6.08	-2.63	4.47	-2.26	3.55	+4.26	3.09	+1.22	1.20	-1.62
Sacramento, Cal	July 1, 1877	3.97	-0.54	3.83	+0.63	3.81	+4.33	3.78	+0.54	0.78	-0.72
San Francisco, Cal.	Mar. 8, 1871	5.01	-1.07	4.16	+2.49	3.26	+4.98	2.12	+4.21	0.68	-0.45
South Pacific Coast:											
Los Angeles, Cal	July 1, 1877	2.21	+0.94	4.30	+9.07	3.44	+8.92	2.00	+1.58	0.57	-0.18
San Diego, Cal.	Nov. 1, 1871	1.81	-0.47	2.61	+6.44	1.88	+4.85	0.84	+2.00	0.41	+1.76
Alaska Stations:											
Alexander, Fort, Alaska ..	Aug. 1, 1881	5.84	(*)	1.33	(*)	3.46	(*)	0.98	(*)	2.11	(*)
Atka, Alaska	Oct. —, 1882	9.04	-1.01	7.31	+3.00	6.38	+0.76	5.41	+0.56	5.90	+0.56
Pyramid Harbor, Alaska ..	Oct. —, 1881	4.45	-1.15	8.12	-3.22	4.01	+1.74	1.79	-0.74	1.78	+1.16
Saint Michael's, Ft., Alaska	June 26, 1874	0.96	-0.39	0.15	+0.02	0.37	+0.41	0.51	-0.23	0.91	-0.68
Sitka, Alaska	Mar. 30, 1881	10.97	+3.04	9.81	-3.66	10.19	+0.86	3.99	-1.23	5.01	+5.34
Unalakshka, Alaska	Aug. 18, 1878	10.20	+1.78	8.34	17.85	6.44	+3.00	5.21	+8.79	5.44	-1.47
Behring's Island, Behring Sea	May 22, 1883	0.78	+0.16	2.24	-0.75	1.02	+0.42	1.20	+0.18	0.84	+0.47

*No record.

therefrom at stations of the Signal Service, &c.—Continued.

June.		July.		August.		September.		October.		November.		December.	
Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -	Normal.	Departure + or -
<i>Inch.</i> 0.67	<i>Inches.</i> -0.34	<i>Inch.</i> 0.56	<i>Inches.</i> -0.33	<i>Inch.</i> 0.84	<i>Inches.</i> -0.11	<i>Inch.</i> 0.85	<i>Inches.</i> +1.06	<i>Inch.</i> 1.81	<i>Inches.</i> -1.45	<i>Inch.</i> 1.47	<i>Inches.</i> -0.97	<i>Inch.</i> 1.48	<i>Inches.</i> +0.64
0.84	+2.47	0.20	+0.40	0.09	-0.02	0.59	+1.52	1.63	-0.11	0.73	-0.61	2.35	+3.32
0.70	+0.03	0.56	+1.11	0.08	+0.09	0.94	+0.02	2.09	+0.73	2.38	-1.99	2.57	+0.65
1.88	+2.78	0.87	+0.43	0.30	-0.24	0.62	+0.39	1.96	+0.12	1.40	-1.04	3.28	-0.49
1.10	+0.02	0.70	-0.38	0.41	-0.82	0.82	+0.58	2.80	+0.65	2.09	-1.84	4.98	+0.12
1.40	-1.18	1.05	+0.01	0.32	+0.22	1.46	+0.07	2.03	-0.81	1.81	-1.22	2.37	+0.91
1.21	+1.89	0.83	-3.23	0.85	+0.11	2.09	+0.07	5.44	-1.14	7.31	-5.94	9.62	-3.89
1.79	-0.37	0.79	+1.01	0.77	-0.44	1.82	+2.43	4.88	-0.87	7.08	-3.84	8.22	-0.70
1.01	+0.89	0.47	-0.42	0.44	(¹)	1.00	(¹)	2.91	-1.76	3.40	-2.61	0.31	-2.89
0.47	+0.45	0.23	+0.23	0.11	+0.22	0.03	+0.25	1.74	-1.22	1.39	-0.09	2.42	+0.16
0.28	+0.89	0.01	-0.01	0.04	-0.04	0.42	-0.06	1.43	-0.53	2.20	-2.16	5.36	+2.37
0.31	+1.14	(²)	(²)	(²)	±0.00	0.33	+0.27	1.04	+0.97	1.17	-1.17	4.05	+0.40
0.33	+2.24	0.01	-0.01	0.01	+0.03	0.16	+0.17	1.23	+1.32	2.52	-2.26	4.93	+2.75
0.22	+1.17	(²)	+0.02	(²)	+0.02	(²)	±0.00	0.59	-0.20	0.96	+0.11	3.92	+0.73
0.07	+0.24	0.02	-0.02	0.21	-0.21	0.05	+0.02	0.48	-0.13	0.66	-0.55	2.33	+2.79
1.71	(¹)	4.48	+1.62	2.96	-0.79	5.26	+1.43	1.94	-1.61	3.65	-2.61	1.32	-0.89
2.86	+1.24	6.10	+5.52	5.51	-1.73	9.02	-0.82	10.32	+2.42	11.59	+0.26	7.80	+1.54
2.06	-6.98	1.98	+0.21	2.22	-0.70	5.18	-2.74	5.02	-3.34	7.07	+0.10	6.33	-1.10
1.12	-0.35	1.64	+2.36	2.43	-1.03	2.86	+2.18	1.32	+0.14	0.82	-0.22	0.66	-0.46
2.29	+0.43	5.56	-0.78	6.10	+0.84	10.78	+2.42	10.04	+3.92	12.98	+3.33	11.43	+4.34
4.82	+7.59	2.51	+1.80	3.41	+1.49	8.84	+2.39	11.04	+0.81	9.40	+10.49	12.43	+15.74
1.07	-1.41	1.94	+0.33	2.07	-0.36	2.23	-0.53	3.02	+0.24	2.59	+0.80	1.63	-0.67

¹Record incomplete

²Inappreciable.

APPENDIX 28.

Average precipitation at selected stations of the Signal Service, United States Army, for each month and the year. (Computed for the decade ending December 31, 1884.)

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
New England:	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Eastport, Me.....	3.52	4.43	5.52	3.06	4.70	3.93	5.38	3.16	3.57	4.56	4.72	4.28	51.22
Portland, Me.....	3.49	3.85	3.84	3.08	3.19	3.58	3.69	2.65	2.97	3.28	3.52	3.57	40.64
Mount Washington, N. H.....	4.43	4.60	7.44	6.80	7.33	8.81	11.66	7.74	9.21	7.91	7.74	6.44	90.13
Boston, Mass.....	4.37	3.97	5.55	4.00	3.21	3.64	4.04	3.46	3.05	4.10	5.04	3.50	43.02
New Haven, Conn.....	3.90	4.47	5.70	3.71	3.30	3.48	5.29	4.46	4.08	3.68	3.86	3.06	49.70
New London, Conn.....	4.47	4.19	5.56	3.60	3.18	3.95	5.03	4.27	3.45	3.97	3.75	3.53	49.07
Middle Atlantic States:													
Albany, N. Y.....	2.65	2.84	3.04	2.58	3.02	4.02	4.30	3.49	3.43	3.21	2.61	2.95	38.15
New York City.....	3.82	3.76	4.47	2.90	2.68	3.31	4.37	4.68	3.56	2.93	3.24	3.75	43.48
Philadelphia, Pa.....	3.30	3.40	3.60	2.36	2.50	3.34	3.65	3.94	3.47	2.33	2.98	2.82	38.40
Atlantic City, N. J.....	4.05	3.53	4.37	3.43	2.32	3.38	3.31	5.51	3.31	2.92	3.56	4.47	44.16
Barneget, N. J.....	4.95	3.78	5.27	2.90	2.53	3.25	4.11	5.10	4.63	3.58	4.27	4.63	49.60
Cape May, N. J.....	4.29	3.49	5.56	3.08	2.40	3.57	3.38	6.54	3.89	3.40	3.80	4.77	48.24
Sandy Hook, N. J.....	4.23	2.73	5.68	3.75	4.14	4.50	4.62	4.98	4.04	3.51	4.17	4.15	51.62
Baltimore, Md.....	3.55	3.54	4.70	3.04	2.81	4.47	4.73	3.88	4.07	2.64	2.97	2.69	44.97
Washington City.....	3.86	3.44	4.56	2.97	2.90	4.92	4.69	4.97	3.97	2.95	3.90	3.77	45.81
Cape Henry, Va.....	5.22	3.21	6.30	5.32	3.09	3.85	6.30	5.28	5.45	4.31	4.12	4.42	56.82
Lynchburg, Va.....	4.21	3.31	4.40	3.13	2.35	3.32	2.94	3.90	3.81	3.06	3.42	4.74	42.59
Norfolk, Va.....	4.46	2.98	4.68	4.34	3.13	4.31	5.42	5.84	5.07	3.48	3.09	3.59	50.33
South Atlantic States:													
Hatteras, N. C.....	6.50	5.25	7.84	5.78	3.89	4.73	6.64	6.24	7.84	7.06	6.51	6.76	74.54
Wilmington, N. C.....	4.02	2.79	4.40	3.78	3.23	7.14	7.02	8.19	7.91	4.06	2.98	3.58	58.78
Charleston, S. C.....	4.22	2.92	4.15	5.65	3.87	6.11	7.70	6.08	6.56	5.28	3.24	3.66	59.37
Augusta, Ga.....	4.74	3.32	5.49	4.81	2.24	4.38	4.16	4.54	3.98	2.30	3.90	4.08	47.94
Savannah, Ga.....	2.93	2.36	3.42	5.28	2.30	7.07	4.42	6.49	5.05	4.19	2.33	3.78	50.64
Jacksonville, Fla.....	3.59	3.32	2.54	4.03	3.88	5.02	5.00	7.20	6.99	7.42	3.26	3.02	55.29
Florida Peninsula:													
Key West, Fla.....	2.31	1.61	0.75	1.58	4.51	4.41	3.72	5.78	6.98	6.96	2.83	1.59	42.97
Eastern Gulf States:													
Montgomery, Ala.....	4.63	4.96	6.01	6.25	3.22	4.20	3.58	3.05	2.96	3.05	3.34	5.85	52.31
Vicksburg, Miss.....	5.81	5.60	7.04	5.81	5.17	3.79	4.15	4.04	4.75	4.13	6.02	6.30	62.21
New Orleans, La.....	5.76	4.79	5.67	6.62	5.02	5.68	6.34	5.46	4.41	3.58	5.40	6.01	64.74
Western Gulf States:													
Shreveport, La.....	4.98	4.67	4.92	5.83	5.31	2.96	4.07	2.40	4.23	4.05	5.43	5.56	54.53
Galveston, Tex.....	4.12	3.21	3.21	3.87	4.52	3.40	3.18	5.27	6.82	5.84	4.86	5.22	52.98
Indianola, Tex.....	2.05	1.80	2.46	1.79	3.54	2.39	2.06	4.46	6.49	4.69	3.26	2.69	37.68
Ohio Valley and Tennessee:													
Knoxville, Tenn.....	6.90	4.98	6.44	5.18	3.08	4.10	5.11	3.87	2.74	3.22	4.20	4.57	54.39
Memphis, Tenn.....	6.58	5.80	6.13	5.58	5.25	5.63	3.17	3.17	2.61	3.88	5.18	4.56	59.50
Nashville, Tenn.....	5.90	5.41	5.89	5.37	3.52	4.26	5.51	3.80	3.63	3.25	3.96	4.14	54.74
Louisville, Ky.....	4.34	4.77	4.56	4.13	3.95	4.53	4.71	3.75	3.01	3.68	3.91	4.56	49.90
Indianapolis, Ind.....	2.69	4.06	4.29	3.28	4.74	6.16	5.04	3.29	2.92	3.21	4.08	3.62	48.02
Cincinnati, Ohio.....	3.99	4.36	4.35	3.14	4.11	5.54	4.08	4.22	2.47	3.25	3.32	4.06	46.87
Pittsburg, Pa.....	3.20	2.74	3.41	2.16	2.90	3.86	4.56	2.92	3.00	2.26	2.62	3.10	36.74
Lower Lakes:													
Buffalo, N. Y.....	2.75	2.76	3.05	2.25	3.23	3.23	3.46	2.91	3.12	3.88	3.48	3.78	38.61
Oswego, N. Y.....	3.37	3.11	3.27	1.84	3.14	3.32	2.98	2.49	2.57	3.26	3.72	4.41	37.48
Erie, Pa.....	3.23	3.30	3.40	2.62	3.72	4.15	2.94	2.94	4.36	4.28	4.75	3.46	43.15
Cleveland, Ohio.....	2.42	3.12	3.28	2.28	3.40	4.37	4.17	2.95	3.38	3.39	2.81	2.91	39.33
Toledo, Ohio.....	1.92	2.07	2.36	1.93	3.47	3.81	3.81	3.04	2.72	3.25	2.94	2.47	33.69
Detroit, Mich.....	1.93	2.91	3.21	2.21	3.74	4.63	4.60	3.37	2.82	3.36	2.90	2.87	37.61
Upper Lakes:													
Alpena, Mich.....	2.17	2.46	2.10	1.80	4.02	4.34	3.72	3.76	4.69	5.04	3.14	2.70	39.95
Escanaba, Mich.....	1.45	1.61	1.85	2.10	3.70	5.06	3.10	4.72	4.69	4.56	2.65	2.04	37.00
Marquette, Mich.....	1.82	1.72	1.58	1.94	2.96	4.46	3.10	3.66	5.25	4.10	2.66	2.69	35.15
Port Huron, Mich.....	1.92	2.40	3.86	2.25	3.10	3.68	2.94	3.03	2.54	3.44	2.70	2.59	34.63
Chicago, Ill.....	1.70	2.87	3.18	3.48	3.76	4.62	4.50	2.78	2.45	4.43	3.12	2.34	39.13
Keokuk, Iowa.....	1.92	2.47	3.20	3.13	3.66	4.38	3.72	2.76	2.71	3.13	2.22	1.94	35.26
Duluth, Minn.....	0.95	1.28	1.70	2.37	4.47	4.67	3.57	3.58	4.52	4.40	1.76	1.61	33.96
Upper Mississippi Valley:													
Saint Paul, Minn.....	1.07	1.19	1.54	1.99	3.48	4.05	3.33	3.58	3.06	2.30	1.26	1.45	24.32
La Crosse, Wis.....	1.18	1.32	1.96	2.12	3.54	4.52	5.54	3.87	5.24	2.92	2.00	1.49	35.71
Davenport, Iowa.....	1.37	1.86	2.61	2.83	4.37	5.49	4.35	3.25	3.16	3.70	2.12	1.71	36.63
Dubuque, Iowa.....	1.33	1.70	2.56	3.04	4.31	5.88	5.90	3.40	4.95	3.42	2.24	1.89	40.62
Keokuk, Iowa.....	1.34	2.10	2.64	2.84	4.57	6.06	4.62	3.20	3.06	3.76	2.21	1.97	39.06
Cairo, Ill.....	4.50	4.30	4.25	3.85	4.40	5.04	4.82	3.15	2.39	3.48	2.24	3.84	42.27
Saint Louis, Mo.....	1.94	3.56	3.23	3.42	3.48	5.17	4.18	2.59	3.02	3.16	3.07	2.32	39.43

Average precipitation at selected stations of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Missouri Valley:	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Leavenworth, Kans	1.09	1.72	2.57	3.60	5.06	5.09	5.13	3.07	3.11	3.78	2.64	1.54	39.40
Omaha, Nebr	0.62	0.88	1.84	3.39	5.52	7.49	6.22	4.18	3.54	3.42	1.22	0.95	39.22
Yankton, Dak	0.58	0.90	1.24	3.50	4.54	5.01	4.43	2.43	2.99	1.86	0.36	0.80	28.64
Extreme Northwest:													
Bismarck, Dak	0.56	0.68	1.15	2.86	3.23	3.64	2.85	2.82	1.44	1.34	0.56	0.85	21.48
Northern Slope:													
Cheyenne, Wyo	0.34	0.15	0.62	1.07	2.45	1.27	1.58	1.56	0.94	0.74	0.28	0.26	11.25
North Platte, Nebr	0.60	0.39	0.64	1.84	3.09	3.73	2.96	2.29	1.40	1.32	0.29	0.79	19.32
Middle Slope:													
Denver, Colo	0.70	0.50	0.88	1.76	3.43	1.53	1.58	1.64	0.78	0.76	0.81	0.84	15.15
Pike's Peak, Colo	1.64	1.29	2.06	3.14	4.11	1.96	4.38	4.20	1.90	1.48	2.26	1.44	29.84
Dodge City, Kans	0.26	0.55	0.82	1.24	4.36	3.08	3.40	3.45	1.07	1.45	0.70	0.78	21.11
Middle Plateau:													
Salt Lake City, Utah	1.33	1.37	2.08	2.60	2.07	0.67	0.41	0.76	0.91	1.31	1.40	1.55	16.97
North Pacific Coast:													
Portland, Oreg	6.73	7.92	6.63	3.64	2.51	1.61	0.89	0.88	2.07	5.74	7.71	3.76	55.04
Middle Pacific Coast:													
San Francisco, Cal	5.28	4.10	3.89	2.57	0.84	0.44	(¹)	0.01	0.22	1.36	2.20	3.36	24.88
South Pacific Coast:													
San Diego, Cal	1.90	2.34	1.62	1.02	0.48	0.09	0.01	0.06	0.05	0.57	0.62	2.38	11.14

¹ Inappreciable.

APPENDIX 29.

Average precipitation at selected stations of the Signal Service, United States Army, for each month and the year. (Computed from January, 1880, to and including December, 1884.)

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
New England:	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Eastport, Me.	3.44	5.21	5.16	3.35	4.09	4.01	5.91	2.29	3.25	4.52	3.02	5.13	52.06
Portland, Me.	4.22	4.82	3.38	2.70	4.06	2.91	4.18	1.75	3.85	3.15	2.64	4.22	41.56
Mount Washington, N. H.	4.40	5.66	7.25	5.87	9.11	8.73	12.45	7.08	9.83	10.20	7.89	6.75	95.19
Boston, Mass.	4.89	4.45	4.73	2.92	4.05	3.13	4.14	2.20	3.52	3.57	2.47	3.61	43.68
New Haven, Conn.	4.84	5.01	5.10	2.31	3.60	3.24	4.60	3.55	4.49	3.76	2.42	4.30	46.91
New London, Conn.	5.32	5.48	5.10	3.33	4.35	4.07	5.04	4.12	3.60	4.51	2.99	4.11	52.21
Middle Atlantic States:													
Albany, N. Y.	2.77	3.07	2.71	2.02	3.48	3.61	4.19	3.05	3.60	2.41	2.80	2.98	26.18
New York City.	4.61	4.24	3.96	2.56	2.95	3.78	4.05	3.69	4.87	2.90	2.43	4.16	43.70
Philadelphia, Pa.	3.87	4.43	3.53	1.85	2.72	3.27	3.14	4.07	3.71	2.87	1.98	2.94	37.58
Atlantic City, N. J.	5.64	4.97	4.60	3.30	2.18	3.16	3.38	5.87	3.37	3.81	3.92	4.79	47.99
Barnegat City, N. J.	5.53	4.94	4.84	2.74	2.53	3.89	3.57	5.41	5.45	4.25	2.81	4.55	50.49
Cape May, N. J.	5.28	4.35	5.61	2.50	3.31	3.63	3.22	5.67	3.22	4.20	3.52	5.17	46.67
Sandy Hook, N. J.	4.68	4.17	4.51	3.25	4.50	4.33	3.99	3.28	4.61	2.81	2.78	3.68	47.56
Baltimore, Md.	4.09	4.55	5.18	2.61	2.27	5.24	4.88	3.23	3.54	2.36	2.08	3.88	43.91
Washington City.	4.70	4.55	5.29	2.88	3.16	5.41	4.10	2.73	3.58	2.10	2.17	4.02	44.70
Cape Henry, Va.	5.64	3.54	6.23	5.10	2.14	4.03	6.69	4.48	3.19	4.59	4.20	4.03	53.80
Lynchburg, Va.	5.01	4.14	4.97	3.15	2.29	3.62	3.25	2.74	3.86	2.44	2.19	5.72	43.68
Norfolk, Va.	4.84	3.31	4.94	4.17	2.65	5.03	6.03	4.41	4.32	3.39	2.97	3.62	49.78
South Atlantic States:													
Charlotte, N. C.	6.59	4.86	6.39	5.33	2.57	4.52	5.19	4.08	3.77	3.52	4.30	4.99	56.06
Charlottesville, N. C.	7.21	5.30	7.44	4.70	3.53	4.70	7.84	6.67	5.33	4.48	7.65	5.22	72.23
Kitty Hawk, N. C.	6.37	3.91	6.69	5.67	2.63	4.59	9.01	8.29	4.26	3.92	5.56	5.06	65.06
Smithville, N. C.	4.71	2.75	4.69	3.54	1.96	2.92	5.98	5.45	4.36	4.06	2.74	3.18	46.34
Wilmington, N. C.	4.42	2.69	5.20	3.34	2.77	4.43	8.70	7.33	6.78	3.21	2.68	2.62	56.38
Charleston, S. C.	3.95	2.37	4.28	3.33	2.80	4.78	6.91	7.16	5.92	3.90	2.75	3.65	51.69
Augusta, Ga.	5.54	3.85	6.18	5.03	2.74	5.59	2.75	4.23	3.35	1.93	3.68	4.06	47.46
Savannah, Ga.	4.29	2.13	3.47	3.69	2.28	5.29	4.05	7.30	4.45	3.53	2.16	4.26	46.98
Jacksonville, Fla.	4.88	2.26	2.89	3.62	3.93	4.98	6.44	7.54	5.43	3.16	4.14	2.59	56.36
Florida Peninsula:													
Cedar Key, Fla.	5.26	2.70	3.31	2.98	2.57	6.15	3.49	9.47	5.52	3.35	3.37	3.56	56.70
Key West, Fla.	2.16	0.72	0.49	2.15	5.05	4.12	3.78	5.68	6.54	6.51	3.28	1.45	41.93
Eastern Gulf States:													
Atlanta, Ga.	7.73	6.57	8.09	6.19	2.43	4.46	2.76	3.67	2.99	1.96	4.86	5.71	57.42
Pensacola, Fla.	5.08	4.48	4.37	5.00	4.97	5.63	6.42	10.48	6.78	4.28	5.10	6.00	66.56
Montgomery, Ala.	4.36	5.85	6.95	5.44	3.04	4.64	3.06	3.60	2.46	2.33	2.98	3.51	50.22
Vicksburg, Miss.	6.98	6.48	6.73	5.49	6.52	3.36	3.38	3.33	4.81	5.02	7.72	7.01	68.53
New Orleans, La.	6.34	3.84	4.72	7.26	5.26	6.53	6.50	4.65	3.38	3.58	4.95	5.76	62.78
Western Gulf States:													
Shreveport, La.	4.62	6.83	4.35	5.55	6.46	2.74	5.16	1.67	4.40	3.85	5.28	6.03	56.92
Little Rock, Ark.	4.75	3.06	5.03	6.28	7.07	3.28	3.90	3.14	2.71	3.94	5.09	5.50	66.35
Galveston, Tex.	4.86	3.61	3.87	2.82	5.15	4.48	2.86	4.06	5.76	7.70	4.61	4.26	53.14
Indianola, Tex.	2.65	1.55	2.46	1.81	4.76	2.91	1.90	4.67	8.06	4.12	3.28	1.63	39.93
Rio Grande Valley:													
Brownsville, Tex.	2.37	0.90	1.00	0.58	3.75	2.23	3.02	4.98	5.26	6.62	3.45	1.76	34.86
Ohio Valley and Tennessee:													
Chattanooga, Tenn.	7.82	5.67	7.74	6.41	3.96	4.81	3.82	4.15	3.98	3.05	4.99	5.50	61.46
Knoxville, Tenn.	7.63	5.34	6.56	5.14	3.18	4.08	5.75	3.90	2.66	3.06	4.06	4.20	55.55
Memphis, Tenn.	6.92	8.70	6.13	5.29	5.75	4.82	2.26	2.82	2.77	4.78	5.36	3.36	59.48
Nashville, Tenn.	6.55	8.51	6.64	5.52	4.72	4.11	3.73	3.87	3.68	4.17	7.79	3.99	58.22
Louisville, Ky.	3.92	7.54	4.09	4.50	4.85	3.74	3.52	3.82	2.90	4.39	3.44	4.30	48.96
Indianapolis, Ind.	2.91	5.76	4.08	3.67	5.69	6.09	3.78	2.23	2.33	4.44	5.34	3.95	49.56
Cincinnati, Ohio.	3.99	6.72	3.99	3.70	5.49	5.68	2.49	2.93	2.47	4.06	3.23	4.38	48.13
Columbus, Ohio.	3.38	4.64	3.60	3.39	4.90	4.03	3.74	3.08	2.43	4.31	3.96	3.69	44.57
Pittsburg, Pa.	3.84	3.74	3.22	2.08	3.65	4.21	3.51	3.07	2.82	2.55	3.33	3.16	37.15
Lower Lakes:													
Buffalo, N. Y.	2.47	3.23	2.48	1.88	4.50	3.67	3.03	3.16	2.05	3.68	3.06	3.62	36.33
Oswego, N. Y.	3.87	3.72	3.44	1.56	4.14	3.21	1.94	2.38	1.79	2.92	4.42	4.53	36.91
Erie, Pa.	3.24	4.12	2.81	2.67	4.10	3.94	3.50	2.76	3.91	3.94	4.94	3.70	43.04
Cleveland, Ohio.	2.04	4.11	2.44	2.85	3.85	4.76	3.98	2.33	3.44	3.92	2.37	2.66	37.34
Toledo, Ohio.	1.91	3.00	1.99	2.31	3.93	4.09	4.56	2.45	3.49	3.83	2.72	2.13	33.47
Detroit, Mich.	2.19	3.29	2.63	2.55	3.93	4.04	3.59	2.74	2.62	3.78	2.90	2.63	36.84

Average precipitation at selected stations of the Signal Service, &c.—Continued.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Upper Lakes:	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>
Alpena, Mich.....	2.68	2.85	2.45	1.89	2.94	5.80	3.59	3.06	3.85	4.49	3.08	2.57	41.04
Escanaba, Mich.....	1.95	1.89	1.44	1.58	3.98	5.03	2.89	4.14	5.62	4.72	2.81	2.26	38.40
Grand Haven, Mich.....	2.75	3.06	3.19	3.17	3.81	5.24	4.89	3.09	3.54	5.12	3.23	3.14	45.28
Marquette, Mich.....	1.80	2.15	1.79	2.32	3.45	3.49	3.09	3.56	5.92	3.98	2.43	3.09	37.07
Port Huron, Mich.....	2.86	3.17	3.26	2.46	3.53	4.59	3.17	3.07	2.00	3.66	2.53	2.38	36.28
Chicago, Ill.....	1.52	3.83	2.85	4.11	4.24	4.57	4.01	2.74	2.23	4.87	3.08	2.29	40.62
Milwaukee, Wis.....	1.69	2.89	2.68	2.19	3.01	4.31	4.21	2.15	2.52	3.70	1.56	1.60	31.50
Duluth, Minn.....	1.04	1.77	1.73	2.32	4.09	4.98	2.93	4.62	4.32	3.36	1.94	1.43	34.56
Upper Mississippi Valley:													
Saint Paul, Minn.....	1.89	1.54	1.60	2.12	2.72	4.34	3.06	2.95	3.78	2.43	1.51	1.55	28.97
La Crosse, Wis.....	1.14	1.19	1.50	2.15	3.13	4.20	6.13	3.44	6.07	3.33	1.64	1.08	35.20
Davenport, Iowa.....	1.46	2.38	2.58	2.57	4.23	6.21	3.56	2.78	3.47	4.77	2.00	1.86	37.86
Des Moines, Iowa.....	1.09	1.70	1.51	2.97	4.46	8.73	4.74	4.36	3.51	5.41	2.27	1.64	44.88
Des Moines, Iowa.....	1.45	2.03	2.40	2.80	4.42	6.02	5.75	3.77	5.17	4.25	1.99	2.11	42.15
Keokuk, Iowa.....	1.51	2.81	2.40	3.08	4.48	6.22	3.06	2.36	2.97	4.61	1.96	1.85	37.32
Cairo, Ill.....	3.91	6.81	3.28	4.06	5.14	3.43	5.01	2.13	3.19	4.23	4.34	3.95	49.50
Springfield, Ill.....	1.90	5.69	3.36	3.19	5.92	6.95	2.89	2.29	3.74	4.93	3.18	3.48	47.52
Saint Louis, Mo.....	1.77	5.21	2.65	3.50	3.50	3.86	3.66	1.72	2.80	4.16	3.73	2.59	39.16
Missouri Valley:													
Leavenworth, Kans.....	1.00	2.85	2.07	2.62	4.66	5.24	5.01	3.45	3.51	4.80	2.23	0.97	37.89
Omaha, Nebr.....	0.80	1.27	1.49	3.23	5.80	7.91	6.63	4.03	4.24	4.46	1.00	0.84	41.71
Yankton, Dak.....	0.64	1.10	1.02	3.45	5.87	3.90	3.49	2.18	2.78	2.67	0.30	0.72	28.13
Extreme Northwest:													
Bismarck, Dak.....	0.37	0.55	0.67	2.40	2.44	3.56	2.51	2.58	1.22	1.40	0.53	0.94	19.17
Buford, Fort, Dak.....	0.89	0.43	0.62	0.96	1.47	2.55	2.26	1.33	1.05	0.83	0.36	0.84	13.61
Northern Slope:													
Custer, Fort, Mont.....	1.33	0.50	0.53	1.17	3.21	3.51	1.21	1.16	0.89	0.78	0.56	0.96	14.80
Deadwood, Dak.....	1.12	0.99	1.62	3.78	5.05	3.98	2.64	2.05	0.90	1.00	1.29	1.21	25.63
Cheyenne, Wyo.....	0.47	0.17	0.58	1.41	2.56	1.56	1.53	1.74	1.06	0.82	0.21	0.33	12.74
North Platte, Nebr.....	0.39	0.51	0.75	1.64	3.51	4.99	2.44	2.61	1.07	2.08	0.21	0.58	20.38
Middle Slope:													
Denver, Colo.....	0.80	0.61	0.48	1.74	3.04	1.72	1.49	1.49	0.55	0.83	0.75	0.78	14.23
Pike's Peak, Colo.....	1.85	1.28	2.18	2.12	4.73	1.49	4.23	4.26	1.67	1.61	1.85	0.98	28.30
Dodge City, Kans.....	0.24	0.71	0.62	1.83	5.92	3.37	4.22	3.82	1.08	2.01	0.89	0.58	24.73
Elliot, Fort, Tex.....	0.38	0.35	0.26	0.80	5.62	2.93	3.04	3.18	2.54	3.25	0.72	0.96	23.97
Southern Slope:													
Comcho, Fort, Tex.....	1.50	1.47	1.5	1.70	6.05	2.06	4.49	4.21	4.35	4.33	1.40	1.62	34.73
Stockton, Fort, Tex.....	0.45	0.55	0.45	0.48	1.60	2.08	2.91	3.73	3.47	2.24	1.05	0.80	24.61
Southern Plateau:													
El Paso, Tex.....	0.53	0.45	0.62	0.37	0.39	0.12	3.86	2.98	1.77	1.82	0.56	1.04	14.41
Apache, Fort, Ariz.....	1.17	2.17	2.16	0.96	0.69	1.22	4.37	5.39	1.82	1.73	0.81	2.43	24.98
Grant, Fort, Ariz.....	0.77	1.62	1.74	0.30	0.81	1.05	3.35	3.88	1.41	1.35	0.80	1.95	18.13
Prescott, Ariz.....	0.72	1.90	2.17	0.79	0.50	0.18	2.86	3.24	1.37	0.55	0.49	2.46	16.73
Middle Plateau:													
Salt Lake City, Utah.....	1.04	1.37	1.57	2.87	1.48	0.64	0.22	1.06	0.68	1.62	1.09	1.48	15.11
Northern Plateau:													
Lewiston, Idaho.....	2.39	1.85	1.18	1.31	1.00	1.88	0.87	0.30	0.62	1.96	1.40	3.28	18.05
Dayton, Wash.....	3.92	4.04	1.99	3.09	1.77	1.10	0.70	0.41	0.82	2.80	2.09	5.06	27.77
North Pacific Coast:													
Olympia, Wash.....	9.17	7.68	3.28	5.27	2.39	1.56	0.55	0.54	2.01	5.20	4.41	9.36	51.42
Portland, Oreg.....	8.66	7.35	3.70	4.50	1.87	1.47	0.90	0.80	1.96	5.52	5.74	10.91	53.40
Middle Pacific Coast:													
Red Bluff, Cal.....	3.73	2.20	3.06	3.45	1.06	0.33	(1)	(1)	0.59	1.61	1.34	5.63	23.02
Sacramento, Cal.....	3.07	2.97	3.74	4.56	0.80	0.41	(1)	(1)	0.47	1.23	1.15	5.42	23.83
San Francisco, Cal.....	3.69	3.43	3.54	4.22	1.06	0.66	(1)	0.01	0.25	1.46	1.66	5.36	25.34
South Pacific Coast:													
Los Angeles, Cal.....	1.71	4.28	4.20	2.22	0.62	0.28	(1)	(1)	(1)	0.56	0.77	3.24	17.89
San Diego, Cal.....	1.62	2.90	2.19	1.26	0.72	0.11	0.02	0.07	0.02	0.71	0.22	2.30	12.14

1 Inappreciable.

[illegible]

No record.

APPENDIX 31.

Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army, for the year ending December 31, 1884.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Accotink, Va.	4.53	5.70	5.77	1.88	3.25	5.53	8.13	0.97	(¹)	1.42	2.61	3.83	42.60
Aiken, S. C.	2.58	3.08	7.16	4.40	3.13	(¹)	(¹)	(¹)	(¹)	(¹)	1.91	6.02	
Ainsworth, Wash.	(¹)	(¹)	(¹)	0.07	0.07	0.90	0.23	0.85	0.07	0.56	(¹)	(¹)	
Albany, Oreg.	3.91	8.90	3.12	4.30	0.89	3.33	1.87	0.43	5.61	2.85	2.18	7.83	45.23
Albion, Idaho	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	1.00	1.90	0.60	7.94	
Allison, Kans.	0.22	0.08	2.81	1.90	0.04	2.94	0.64	3.14	0.65	1.50	0.13	0.80	29.85
Amherst, Mass.	2.00	4.63	5.07	2.48	2.03	1.88	3.75	5.10	1.25	2.40	2.53	5.88	40.38
Andersonville, Ga.	(¹)	3.18	7.52	4.17	1.27	(¹)	8.78	4.10	(¹)	(¹)	(¹)	(¹)	
Anna, Ill.	2.01	5.38	4.05	3.80	4.99	7.44	5.49	2.65	3.33	1.42	2.58	0.57	52.71
Ann Arbor, Mich.	1.07	(¹)	(¹)	1.05	(¹)	(¹)	(¹)	(¹)	2.91	(¹)	1.84	(¹)	
Antrim, N. H.	(¹)	(¹)	(¹)	4.70	2.95	1.30	2.95	2.75	2.70	2.55	8.35	5.10	
Aroher, Fla.	5.43	2.14	5.83	2.45	4.73	11.08	8.33	3.35	1.96	0.29	3.80	2.75	55.70
Ardens (Phillipstown), N. Y.	(¹)	(¹)	(¹)	(¹)	2.43	1.91	3.33	3.07	2.23	(¹)	(¹)	(¹)	
Ashland, N. H.	5.65	5.29	5.64	2.89	(¹)	3.05	3.62	3.35	1.07	2.79	3.76	5.10	
Asheville, N. C.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	1.16	2.90	
Ashwood, Tenn.	6.80	7.30	6.10	6.00	3.90	3.90	7.00	1.70	0.60	2.40	1.76	2.70	61.00
Atchison, Kans.	(¹)	0.31	2.75	5.47	2.60	5.75	5.50	2.90	5.90	2.90	1.80	0.90	
Athens, Ga.	(¹)	(¹)	(¹)	6.07	0.82	10.48	5.70	2.62	0.01	0.51	3.76	5.97	
Auburn, N. Y.	2.86	1.88	1.71	0.30	3.07	1.68	2.78	2.77	3.55	3.38	2.05	2.41	29.14
Austin, Tenn.	5.83	8.27	8.25	2.10	3.47	(¹)	4.08	2.29	1.51	2.71	1.77	3.34	
Austin, Tex.	(¹)	(¹)	4.45	7.78	7.85	1.46	(¹)	0.94	1.78	2.63	3.40	1.68	
Bainbridge Island, Wash.	4.40	2.53	0.97	2.50	0.55	3.70	0.10	1.35	2.48	6.20	2.53	(¹)	
Bandon, Oreg.	(¹)	(¹)	(¹)	3.96	0.53	1.23	1.03	(¹)	5.13	3.12	3.93	12.65	
Belmont, N. H.	4.09	4.41	4.37	4.10	(¹)	1.43	2.27	4.25	0.72	2.62	4.01	4.22	
Beloit, Wis.	0.64	(¹)	1.52	2.85	2.49	5.15	4.27	2.94	2.22	3.96	1.72	4.24	
Belvidere, N. J.	4.49	4.78	(¹)	2.86	(¹)	(¹)	0.12	5.90	1.21	2.95	(¹)	(¹)	
Bethel, Conn.	4.55	5.10	3.30	1.90	3.05	3.90	7.16	6.20	1.07	3.26	3.95	6.52	49.86
Blackburg, Va.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	3.09	2.85	1.00	0.84	1.00	2.19	
Bloomington, Pa.	2.30	2.31	(¹)	1.40	3.30	2.50	8.50	4.70	(¹)	(¹)	3.00	3.40	
Blue Lake, Cal.	(¹)	(¹)	(¹)	(¹)	(¹)	1.56	0.24	0.01	3.23	2.17	1.37	2.54	
Bowling Green, Ky.	4.69	6.89	5.12	(¹)	(¹)	(¹)	3.97	(¹)	(¹)	(¹)	1.59	(¹)	
Brevard, N. C.	6.72	10.07	14.53	5.02	2.12	12.94	(¹)	2.57	0.70	0.79	4.05	10.25	
Bristol, N. H.	4.41	5.67	3.08	2.87	3.59	2.10	2.84	6.50	0.52	2.32	2.98	0.58	41.43
Bunker Hill, Ill.	1.51	4.11	3.79	2.38	4.27	3.96	2.30	2.56	7.19	2.33	1.98	5.90	42.01
Burlington, Vt.	2.14	2.68	2.89	1.92	3.60	1.36	(¹)	(¹)	2.22	3.82	2.95	2.60	
Cahuenga, Cal.	(¹)	(¹)	(¹)	(¹)	0.69	0.81	0.00	(¹)	(¹)	0.51	1.17	3.66	
Caldwell, N. J.	5.54	6.51	4.65	3.20	4.56	5.80	6.62	6.50	(¹)	(¹)	(¹)	(¹)	
Carson City, Nev.	2.46	2.77	3.23	1.29	0.29	1.97	0.00	0.62	0.22	0.22	0.00	4.75	17.82
Catawissa, Pa.	3.17	3.61	4.08	2.92	3.38	3.63	2.23	2.27	2.66	3.69	2.98	3.77	38.96
Cath Soph, S. A.	(¹)	(¹)	(¹)	(¹)	9.10	5.84	3.62	2.89	1.16	2.94	0.00	(¹)	
Cedar Rapids (W), Iowa.	3.71	1.41	2.47	2.12	3.08	3.38	(¹)	(¹)	(¹)	(¹)	1.37	3.54	
Chambersburg, Pa.	3.23	4.43	4.90	1.22	4.42	5.22	5.20	2.22	0.89	2.27	1.51	4.53	40.34
Chapel Hill, N. C.	4.85	2.58	6.20	2.68	4.97	8.99	6.63	4.64	0.52	0.83	(¹)	6.98	
Charlotte, Vt.	3.60	4.90	4.25	2.90	4.40	2.20	5.00	2.90	3.00	4.10	4.00	4.50	45.75
Chester, Minn.	(¹)	(¹)	0.48	2.83	2.88	7.78	3.88	7.79	6.20	3.47	6.85	0.95	
Cincinnati (G. W. H.), Ohio.	1.59	6.45	2.24	2.34	4.97	2.38	0.28	(¹)	3.72	1.25	1.08	3.38	
Cincinnati, Tex.	2.49	10.38	2.98	(¹)	9.53	5.77	0.12	4.65	1.03	1.78	2.60	7.48	
Clay Centre, Kans.	0.71	1.11	(¹)	(¹)	(¹)	3.23	3.98	5.68	6.02	2.24	1.23	1.12	
Cleburne, Tex.	0.88	4.12	6.25	3.64	5.03	10.09	0.32	0.62	1.00	2.01	3.00	4.01	40.37
Cleveland, Ohio.	2.48	5.01	2.42	1.91	3.00	2.06	4.01	1.90	3.77	1.87	2.02	2.82	23.27
Clinton, Ind.	(¹)	(¹)	(¹)	(¹)	4.30	10.64	7.91	0.75	(¹)	(¹)	(¹)	(¹)	
Cockburn Harbor, B. W. I.	(¹)	(¹)	(¹)	0.26	(¹)	(¹)	(¹)	(¹)	(¹)	7.15	0.90	2.36	
College City, Cal.	3.61	2.21	5.46	2.48	0.17	2.04	0.00	(¹)	0.36	0.29	0.69	5.14	
College Hill, Ohio.	3.50	5.00	2.00	1.25	4.75	2.00	1.70	0.70	4.38	2.70	5.00	4.12	33.00
Collinsville, Ill.	0.83	4.46	2.88	3.44	4.21	3.73	2.21	1.82	3.60	1.64	2.16	5.63	36.71
Conception, Mo.	0.75	0.43	2.41	2.44	3.84	3.02	6.12	2.02	4.07	2.92	0.94	1.46	30.43
Contocook, N. H.	4.15	5.00	4.20	(¹)	2.35	1.05	2.00	2.00	(¹)	1.75	(¹)	4.60	
Cooperstown, N. Y.	3.17	3.16	4.48	1.20	3.97	2.16	3.01	2.46	1.29	3.31	2.56	4.00	25.07
Cornish, Me.	2.74	7.28	5.31	(¹)	4.88	1.88	5.27	4.53	1.39	3.56	3.00	5.92	
Cresco, Iowa.	0.88	1.51	1.64	2.71	2.44	4.47	4.23	3.84	3.18	2.83	0.68	2.80	24.00
Crete, Nebr.	0.41	0.41	1.20	3.02	1.79	1.39	5.94	3.18	1.46	3.80	0.02	0.19	22.61
Cumberland, Md.	1.85	3.64	5.14	1.98	5.33	3.33	4.61	1.49	0.93	1.98	0.92	4.25	35.43
Dale Enterprise, Va.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	1.97	5.65	1.32	0.91	2.96	5.04	

¹ No record.² Inappreciable.

Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
De Soto, Nebr.	In. 0.65	In. 1.23	In. 3.20	In. 2.39	In. 1.81	In. 3.99	In. 7.67	In. 5.95	In. 8.11	In. 4.52	In. 0.12	In. 1.20	In. 41.04
Distributing Reservoir, D. C.	5.28	7.19	7.00	2.87	1.90	6.20	8.08	0.83	0.22	1.62	3.23	4.63	48.50
Dorset, Vt.	2.61	5.17	4.03	2.49	3.96	2.66	2.52	4.89	0.85	4.69	4.73	4.63	44.18
Drifton, Pa.	4.30	(¹)	4.04	4.36	3.62	2.68	6.77	4.79	2.50	2.67	3.63	4.76	.....
Dudley, Mass.	(¹)	(¹)	(¹)	(¹)	2.93	(¹)	(¹)	3.24	1.06	1.03	2.14	(¹)	.....
Dyberry, Pa.	3.75	5.59	3.98	3.00	3.86	1.27	6.92	4.23	2.53	2.84	2.48	3.74	41.94
East Harbor, B. W. I.	1.56	1.04	(¹)	(¹)	5.91	4.53	(¹)	2.76	(¹)	(¹)	(¹)	(¹)	.....
Easton, Pa.	4.73	4.77	4.97	2.38	2.28	2.87	5.19	5.91	1.01	3.96	3.26	0.07	47.40
East Portland, Oreg.	(¹)	(¹)	(¹)	2.16	0.09	0.12	2.04	0.03	0.08	3.14	(¹)	2.97	.....
Elk Falls, Kans.	2.50	1.50	(¹)	4.00	4.00	2.00	7.50	6.00	6.00	7.85	2.60	4.02	.....
Embarra, Wis.	(¹)	(¹)	1.75	3.40	3.75	3.35	6.25	7.70	9.40	7.85	2.60	5.51	.....
Emmitsburg, Md.	(¹)	(¹)	(¹)	2.14	7.19	0.40	(¹)	(¹)	0.82	1.55	3.08	4.00	.....
Emporia, Kans.	(¹)	1.16	(¹)	4.38	2.49	4.84	4.71	4.43	3.15	1.72	1.93	1.81	.....
Eola, Oreg.	3.46	5.54	2.49	3.09	0.42	1.87	2.29	0.17	6.59	2.80	2.83	6.09	37.44
Factoryville, N. Y.	2.42	2.07	4.37	1.49	3.54	1.24	2.63	2.07	1.74	2.86	1.41	2.73	28.57
Fall Brook, Cal.	3.56	15.39	10.90	(¹)	(¹)	(¹)	(¹)	(¹)	0.53	0.54	7.15	.....	.....
Fall River, Mass.	6.25	6.15	5.63	3.71	4.25	4.05	5.19	6.33	0.88	2.17	3.56	6.94	55.06
Fallingston, Pa.	4.90	5.04	4.79	2.25	4.48	5.80	4.24	4.58	0.22	2.80	3.12	6.00	47.22
Fallston, Md.	4.16	7.01	5.71	1.94	3.86	5.50	3.57	8.00	0.23	1.48	3.14	0.06	45.16
Fayetteville, Ark.	2.70	8.05	3.32	5.03	4.14	4.77	5.48	3.77	4.92	2.17	(¹)	(¹)	.....
Flat Rock, N. C.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	3.51	3.11	0.53	0.05	(¹)	.....
Forsyth, Ga.	3.97	4.87	11.98	4.93	1.72	6.73	(¹)	4.20	1.60	0.10	3.86	4.73	.....
Fort Collins, Colo.	(¹)	(¹)	1.15	8.92	4.84	(¹)	1.25	(¹)	(¹)	0.10	0.15	0.35	.....
Fort Madison, Iowa	0.90	1.50	4.70	2.00	4.95	4.23	1.41	6.87	3.87	5.40	1.90	3.16	40.59
Fort Scott, Kans.	1.45	2.33	2.44	7.53	9.03	3.89	10.76	4.71	11.45	2.33	(¹)	4.00	.....
Fort Wayne, Ind.	2.50	4.01	2.73	1.51	4.02	2.05	5.63	0.95	2.25	3.40	1.50	4.95	35.50
Frankfort, Ky.	5.05	8.56	(¹)	3.32	5.19	2.80	(¹)	1.66	6.07	1.64	(¹)	4.16	.....
Franklin, Pa.	3.20	4.35	3.66	1.47	2.89	5.54	4.85	3.33	2.64	3.08	1.77	3.72	42.00
Franklin, Wis.	(¹)	(¹)	(¹)	6.30	3.45	2.63	(¹)	3.48	1.37	4.24	(¹)	2.25	.....
Fremont, Nebr.	1.60	1.19	2.76	3.20	1.40	3.29	9.06	(¹)	5.81	2.72	0.21	2.01	.....
Gardiner, Me.	4.70	7.29	5.40	6.53	4.00	1.22	5.17	4.22	2.11	3.14	3.29	5.05	52.82
Garrettsville, Ohio	5.45	(¹)	4.17	1.53	1.79	1.49	5.30	1.62	3.70	2.56	1.63	2.99	.....
Geece, Nebr.	0.70	1.20	2.75	3.05	4.20	2.47	7.90	3.85	3.02	2.80	0.05	1.65	33.04
Germantown, Pa.	(¹)	(¹)	4.18	2.02	3.25	4.57	4.38	4.02	0.14	2.22	(¹)	3.79	.....
Granpian Hills, Pa.	3.29	4.69	5.10	3.00	2.66	9.85	5.29	4.07	2.14	3.76	1.82	8.65	49.52
Grand Coteau, La.	9.88	2.50	10.20	5.62	14.03	2.50	2.64	1.75	0.75	3.81	3.57	14.43	71.89
Grand Junction, Colo.	(¹)	(¹)	(¹)	1.74	(¹)	(¹)	(¹)	1.62	0.18	(¹)	(¹)	(¹)	.....
Grand Turk Island, B. W. I.	1.10	0.80	1.37	0.04	2.33	2.24	(¹)	1.67	(¹)	8.21	3.38	1.88	.....
Great Falls Reservoir, Md.	5.10	5.75	5.84	1.98	3.19	5.80	4.50	1.73	(¹)	1.73	3.41	4.16	.....
Green Springs, Ala.	7.67	6.48	9.17	5.19	1.18	7.57	12.02	1.61	1.25	2.41	2.02	5.89	61.89
Guttenberg, Iowa	0.76	1.79	1.87	1.60	2.84	4.18	2.95	4.61	3.50	2.78	0.66	2.30	30.04
Hartford, Conn.	(¹)	(¹)	(¹)	(¹)	3.36	1.73	5.98	2.67	0.79	2.88	2.78	0.09	.....
Haverford College, Pa.	(¹)	5.88	4.92	2.47	3.83	5.72	5.10	8.24	0.20	2.24	3.48	5.32	.....
Helvetia, W. Va.	6.00	5.24	4.96	2.70	4.51	5.69	6.12	4.30	0.92	2.45	2.66	4.30	48.85
Hillside, N. C.	3.90	10.10	13.55	5.40	2.45	8.35	3.37	4.03	1.40	1.42	4.54	11.91	70.15
Hillsdale, Mich.	1.11	4.36	2.48	1.70	4.13	5.39	1.06	0.62	2.64	3.48	2.41	4.14	33.32
Hiram, Ohio	5.14	(¹)	5.28	1.92	(¹)	1.64	4.12	1.63	4.25	2.83	2.17	3.49	.....
Holton, Kans.	1.12	0.37	4.75	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	3.12	1.40	1.40	.....
Hudson, Mich.	2.36	3.42	(¹)	(¹)	4.38	3.61	1.39	1.29	1.72	3.68	1.68	2.33	.....
Hulmeville, Pa.	3.15	5.80	(¹)	(¹)	1.80	4.87	3.55	2.69	(¹)	(¹)	(¹)	(¹)	.....
Humboldt, Iowa	0.20	1.19	3.04	3.27	2.62	3.47	4.49	4.27	5.66	8.98	0.69	2.50	34.86
Humphrey, N. Y.	2.14	3.62	3.50	2.14	5.11	14.15	5.27	4.80	4.82	3.93	2.93	3.69	56.10
Hydesville, Cal.	4.43	4.80	7.03	6.25	0.50	0.63	0.05	0.02	1.02	0.98	0.69	(¹)	.....
Independence, Iowa.	1.35	1.70	3.15	1.68	3.70	4.75	6.00	4.75	10.90	2.10	1.10	2.04	43.62
Independence, Kans.	0.68	2.23	1.00	4.85	1.27	2.52	5.77	5.83	9.71	4.22	2.58	3.34	40.00
Indianola, Iowa.	0.38	1.88	2.50	1.83	3.56	3.80	11.51	2.81	3.94	4.43	1.18	2.29	50.22
Ionia, Mich.	2.24	3.87	3.51	2.16	2.81	2.93	3.02	0.55	3.26	3.00	1.91	5.25	35.31
Ithaca, N. Y.	3.18	2.64	3.41	1.88	4.36	1.35	4.87	3.75	1.72	2.90	1.74	2.42	34.17
Jacksonburg, Ohio	2.60	7.65	3.10	2.55	5.40	1.63	1.70	1.20	(¹)	1.15	0.83	3.40	.....
Jeffersonville, Ind.	(¹)	8.81	3.60	2.30	4.94	4.06	3.54	3.36	5.27	1.81	1.65	4.72	.....
Johanna Maria, B. A.	(¹)	(¹)	(¹)	(¹)	5.68	10.68	1.77	1.45	1.00	0.45	0.00	(¹)	.....
Johnstown, Va.	6.65	6.55	8.75	1.70	(¹)	1.05	4.05	2.10	(¹)	(¹)	0.90	4.00	.....
Kalamazoo, Mich.	(¹)	4.32	(¹)	2.11	3.96	4.86	2.59	1.82	2.39	2.88	1.81	7.14	.....
Kelley's (near Raleigh), N. C.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	7.25	7.80	(¹)	3.10	9.40	.....
Kennewick, Wash.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	4.44	0.86	.....
Kew, B. W. I.	(¹)	(¹)	(¹)	0.78	12.06	7.84	(¹)	3.26	(¹)	12.14	2.36	4.65	.....
Klamath Agency, Oreg.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	0.24	0.02	(¹)	(¹)	10.58	.....	.....
Laconia, Ind.	3.19	9.19	5.05	2.46	4.07	4.73	3.42	4.12	5.13	2.09	1.04	4.48	48.88
Lafayette, Ind.	1.09	5.08	1.87	2.79	3.31	4.12	5.81	1.12	2.43	2.54	1.44	6.27	37.87
Lake Village, N. H.	4.16	5.02	5.81	3.40	(¹)	1.88	4.32	3.32	0.83	2.18	3.52	4.12	.....
Lancaster, Wis.	(¹)	(¹)	2.02	2.22	3.39	4.82	5.58	5.65	4.53	3.35	0.72	4.02	.....
Lansing, Mich.	1.92	3.24	3.71	2.12	4.34	3.09	3.24	1.34	2.71	6.91	1.60	2.77	36.99
Lawrence, Kans.	1.28	1.13	2.73	5.62	3.57	3.81	(¹)	(¹)	(¹)	2.38	0.40	2.56	.....
Lead Hill, Ark.	2.05	10.93	3.95	3.89	5.93	3.57	5.04	4.78	5.14	0.94	4.71	11.37	62.30

¹ No record.

² Inappreciable.

Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Lectsdale, Pa.	5.33	5.11	3.97	1.28	2.88	5.29	7.01	2.07	1.99	2.22	1.43	4.84	43.42
Lenoir, N. C.	3.80	4.90	9.40	4.60	2.40	10.30	1.70	3.30	0.60	0.70	1.00	8.10	50.70
Le Roy, N. Y.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	8.07	2.22	1.77	1.92	2.18	
Limona, Fla.	0.38	0.71	2.15	3.20	3.43	9.45	4.75	8.28	3.75	0.99	1.45	0.80	39.31
Lincolnton, N. C.	(¹)	(¹)	(¹)	(¹)	(¹)	4.47	2.51	1.51	0.17	0.99	2.61	9.32	
Logan, Iowa	1.30	1.59	1.70	3.10	2.10	3.40	7.40	5.00	5.50	4.40	0.10	1.10	36.60
Logansport, Ind.	1.80	4.43	1.50	2.19	3.42	4.25	3.17	1.83	2.29	3.26	1.82	5.82	35.78
Luling, La.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	3.60	0.68	8.84	(¹)	(¹)	(¹)	
Lunenburg, Vt.	3.20	2.30	1.50	0.86	4.25	1.95	2.50	2.40	2.65	5.00	1.90	2.80	31.31
Madison, Nebr.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	3.35	(¹)	(¹)	(¹)	0.08	
Madison, Wis.	(¹)	(¹)	2.31	4.51	4.21	5.47	8.44	4.39	4.25	4.00	1.53	5.68	
Manatee, Fla.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	3.73	0.03	3.66	1.46	2.00	
Manchester, Iowa	(¹)	1.33	1.99	2.31	2.67	3.99	8.78	2.42	7.25	2.48	1.12	2.57	
Manhattan, Kans.	(¹)	0.55	2.68	3.45	5.13	(¹)	6.83	5.02	5.64	2.48	(¹)	(¹)	49.43
Manistiquic, Mich.	0.04	4.47	0.84	2.32	1.79	0.97	8.47	4.50	6.63	6.83	2.65	5.05	
Manitowoc, Wis.	(¹)	1.59	4.30	2.43	5.16	5.44	4.81	1.55	5.03	(¹)	(¹)	5.36	
Margaretta Township, Ohio	1.18	4.67	2.99	1.48	3.46	2.15	5.62	1.71	3.88	1.06	0.72	2.85	31.27
Marion, Va.	4.42	5.82	6.70	8.37	2.04	3.97	1.22	3.27	0.32	1.10	0.44	4.60	36.98
Marquette, Nebr.	7.75	5.37	4.68	3.12	5.36	1.58	8.25	1.70	1.79	2.17	(¹)	0.60	
Marshall, Mich.	2.80	3.90	(¹)	0.51	3.83	4.72	8.73	1.08	1.48	3.67	(¹)	(¹)	
Mattison, Ill.	0.90	5.44	2.75	4.16	5.00	6.87	3.65	2.20	4.70	2.80	1.83	5.45	45.75
Maud, Kans.	(¹)	(¹)	(¹)	2.45	(¹)	5.87	1.77	7.03	0.19	0.78	2.06	0.80	
Maysport, Fla.	3.53	3.62	3.06	1.68	4.41	7.23	5.68	6.32	5.55	8.51	3.78	2.96	51.52
Mazatlan, Mex.	3.86	(¹)	(¹)	(¹)	1.50	2.01	9.26	5.60	16.50	3.87	5.51	2.05	
McDonogh, Md.	(¹)	6.04	6.24	1.38	3.18	2.95	5.44	2.11	0.18	1.64	3.86	3.81	
Menand Station (near Albany), N. Y.	0.96	1.75	4.83	1.07	2.89	1.96	3.95	6.16	1.57	3.00	3.36	3.13	35.22
Mendon, Mass.	(¹)	(¹)	(¹)	(¹)	(¹)	2.30	(¹)	(¹)	(¹)	(¹)	1.10	(¹)	
Mendon, Mich.	(¹)	(¹)	(¹)	1.97	5.39	2.19	3.38	1.87	2.07	(¹)	(¹)	(¹)	
Milan, Tenn.	4.45	7.96	4.49	5.35	4.98	3.84	8.51	1.58	4.95	2.82	1.61	7.25	57.99
Milledgeville, Ga.	(¹)	(¹)	8.88	4.61	1.69	7.64	2.52	3.38	0.00	0.69	1.54	5.87	
Millton, Mass.	5.72	5.46	4.70	4.21	8.01	4.22	8.75	4.20	0.65	2.98	3.43	4.27	46.60
Minneapolis, Minn.	0.78	0.22	0.95	1.73	2.99	4.18	(¹)	3.91	5.27	3.08	0.66	2.31	
Monticello, Iowa	0.61	1.15	3.90	1.86	3.74	2.82	3.99	3.78	6.80	3.19	1.59	4.34	37.77
Moorestown, N. J.	4.36	5.33	4.64	1.05	3.29	3.52	3.78	5.08	0.16	2.29	3.40	5.37	42.57
Mottville, Mich.	1.12	3.34	3.58	1.58	27.16	(¹)	2.00	0.70	(¹)	(¹)	1.99	(¹)	
Mountainville, N. Y.	5.84	4.49	3.96	2.45	(¹)	3.73	7.72	3.42	0.98	3.38	4.44	5.23	
Mount Forest, Canada.	(¹)	(¹)	(¹)	0.94	(¹)	4.88	7.18	(¹)	2.73	(¹)	(¹)	(¹)	
Mount Ida, Ark.	2.30	9.80	4.90	8.30	10.25	2.25	5.30	1.05	2.65	0.70	2.55	15.95	66.00
Muscataine, Iowa	1.05	1.40	4.28	2.08	5.57	4.03	3.63	5.77	2.38	6.46	1.57	4.42	45.49
Nayatt Point, R. I.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	2.65	4.60	7.68	7.03	(¹)	
Nellisville, Wis.	(¹)	(¹)	0.79	1.80	3.30	3.41	6.05	6.32	8.60	4.00	0.28	2.31	
Nephi, Utah	0.86	3.70	2.15	6.30	2.70	0.50	0.25	0.85	1.70	2.05	0.00	5.40	26.96
New Athens, Ohio	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	1.39	2.46	2.39	1.37	4.43	
New Bedford, Mass.	4.70	5.67	(¹)	(¹)	3.37	(¹)	0.48	8.41	0.96	1.61	3.49	5.97	
Newport, Vt.	3.55	4.03	3.61	2.56	6.79	4.33	8.71	8.45	3.32	5.88	4.16	3.21	48.60
New Tacoma, Wash.	4.93	(¹)	1.27	(¹)	(¹)	2.81	1.80	1.29	3.21	(¹)	1.84	4.88	
New Ulm, Tex.	3.43	2.58	4.86	4.68	15.25	2.82	0.00	0.21	5.18	1.78	4.99	(¹)	
North Colebrook, Conn.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	2.50	3.99	5.30	
Northfield, Minn.	0.75	1.82	1.17	2.02	2.56	5.16	2.69	3.48	5.31	3.45	0.00	2.33	31.54
North Lewisburg, Ohio	1.90	4.55	3.10	1.75	2.05	1.90	4.35	0.80	7.60	1.05	0.85	4.40	34.30
Northport, Mich.	4.00	2.15	4.68	16.50	19.85	5.60	10.75	8.25	1.75	1.24	7.00	2.00	78.67
North Volney, N. Y.	3.70	3.25	3.90	0.80	(¹)	1.15	2.50	3.20	2.20	8.00	2.40	3.50	
Oakland, Cal.	3.81	6.25	8.59	5.79	0.55	3.03	(¹)	0.25	0.25	2.80	0.05	7.73	38.26
Orono, Mo.	4.44	6.85	4.37	3.38	5.42	1.37	2.38	3.12	2.19	2.70	3.99	4.74	44.60
Ottumwa, Iowa	(¹)	1.11	3.45	3.51	4.00	4.21	5.44	4.92	2.89	5.54	2.12	3.12	
Palermo, N. Y.	5.05	3.60	8.23	0.68	1.48	1.27	1.69	2.19	1.81	2.65	2.18	3.42	28.35
Paramaribo (Dutch Guiana), S. A.	6.50	(¹)	(¹)	(¹)	18.38	8.45	8.16	1.74	2.20	0.29	1.27	2.97	
Paterson, N. J.	5.16	5.74	3.20	2.40	4.47	(¹)	6.46	(¹)	0.69	(¹)	(¹)	(¹)	
Penn Yan, N. Y.	3.28	2.15	2.68	1.83	2.73	2.32	3.69	2.13	1.82	1.52	1.09	1.99	26.73
Peoria, Ill.	0.70	3.18	2.17	2.62	5.50	3.87	3.67	4.18	5.76	4.80	2.19	3.21	41.89
Phillipsburg, N. J.	3.88	4.38	3.47	2.07	(¹)	3.73	4.91	3.40	4.01	1.58	2.72	4.59	
Pierce City, Mo.	0.90	4.70	1.30	5.60	4.10	4.20	5.10	3.70	7.30	(¹)	(¹)	(¹)	
Plant Waterloo, S. A.	(¹)	(¹)	(¹)	(¹)	(¹)	0.85	0.98	4.50	1.02	0.00	0.00	(¹)	
Pleasant Grove, Wash.	(¹)	(¹)	0.62	1.26	0.17	0.47	1.16	(¹)	0.33	0.71	0.16	2.07	
Point Pleasant, La.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	0.00	0.44	0.44	7.99	20.39	
Port Jervis, N. Y.	3.62	4.29	4.45	3.29	3.75	2.12	5.56	5.18	1.15	2.29	3.89	4.23	43.32
Portsmouth, Ohio	5.34	6.11	5.53	3.90	4.89	3.47	2.45	1.35	1.67	1.22	1.46	4.70	42.31
Poway, Cal.	1.50	(¹)	0.96	4.81	2.26	0.44	(¹)	(¹)	(¹)	0.24	0.35	5.91	
Prairie du Chien, Wis.	(¹)	(¹)	(¹)	(¹)	2.42	3.10	4.19	5.91	5.41	2.80	1.70	2.78	
Princeton, Cal.	4.03	2.35	5.06	2.71	0.05	2.12	0.00	(¹)	1.13	1.10	(¹)	0.08	
Princeton, Mass.	7.50	7.44	6.91	5.75	3.29	3.45	4.57	5.78	1.59	2.99	5.29	0.58	64.21
Providence, R. I.	(¹)	(¹)	(¹)	4.25	2.94	4.31	(¹)	1.51	2.73	3.50	6.59	(¹)	

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Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Pueblo, Colo.	In. 0.87	In. 0.72	In. 0.05	In. 8.53	In. 1.60	In. 2.85	In. 0.72	In. 2.35	In. 0.40	In. (?)	In. 0.05	In. 0.78	In. 12.68
Puerto de Luna, N. Mex.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Quakertown, Pa.	2.96	4.74	4.99	2.70	3.58	6.84	7.92	3.76	(1)	(1)	8.53	6.46	.....
Quitman, Ga.	6.00	(1)	5.05	(1)	(1)	(1)	(1)	(1)	(1)	0.40	2.00	6.60	.....
Raleigh, N. C.	5.70	(1)	(1)	(1)	1.20	(1)	(1)	3.60	7.00	0.50	(1)	4.50	.....
Readington, N. J.	(1)	(1)	(1)	(1)	8.40	8.80	5.80	3.00	0.40	3.40	4.30	7.00	.....
Receiving Reservoir, D.C.	5.60	6.62	6.69	2.67	2.70	8.12	5.99	0.89	0.24	(1)	3.36	5.08	.....
Red Willow, Nebr.	0.58	(1)	1.10	1.47	5.84	2.28	7.04	5.24	0.12	0.78	0.20	1.17	.....
Richardson, Dak.	(1)	0.90	1.00	4.02	1.40	6.00	5.20	6.40	2.50	0.70	0.70	1.50	.....
Richmond, Ky.	(1)	(1)	(1)	3.63	2.43	3.21	6.35	1.74	3.90	2.29	1.58	2.76	.....
Riley, Ill.	0.80	2.20	1.51	2.85	2.56	4.22	4.19	3.36	4.34	8.85	1.79	3.28	34.96
Ripon, Wis.	(1)	(1)	2.15	2.26	0.75	2.93	6.90	(1)	(1)	(1)	(1)	(1)	.....
Rockford, Ill.	1.42	1.91	2.88	3.45	3.43	6.16	6.13	3.68	3.85	6.24	1.99	6.51	47.66
Rowe, Mass.	3.27	5.10	4.65	1.85	3.15	1.60	6.10	3.22	0.95	8.02	3.70	5.03	40.64
Ruggles, Ohio	2.20	3.75	(1)	0.85	2.60	1.45	2.80	1.00	3.80	1.45	0.85	2.15	.....
Sacramento, Cal.	3.18	4.10	7.63	4.30	0.09	1.57	0.00	0.01	0.57	1.85	(1)	8.89	82.19
Salina, N. J.	(1)	(1)	(1)	3.06	1.32	2.49	2.20	4.07	0.74	1.34	3.15	(1)	.....
Salina, Kans.	0.02	0.05	1.00	2.09	2.07	5.09	5.00	3.09	1.04	0.09	0.08	0.06	19.77
Salina City, Cal.	1.70	4.49	5.09	3.05	0.72	2.66	0.00	0.18	0.11	1.79	(1)	4.46	.....
Salt Cay, B. W. I.	0.83	0.52	(1)	0.24	1.01	1.23	(1)	1.17	(1)	12.27	3.64	8.75	.....
Sandwich, Ill.	(1)	3.48	2.08	(1)	2.10	3.24	7.06	1.93	2.52	4.95	1.48	5.23	.....
San Rafael, Cal.	(1)	(1)	(1)	(1)	(1)	(1)	0.03	0.28	3.03	0.17	20.96	.....	.....
Shorlock, Kans.	(1)	(1)	0.45	0.88	7.94	3.70	5.31	8.20	1.09	1.40	0.24	1.38	.....
Snowville, Va.	(1)	(1)	(1)	(1)	2.20	7.80	3.00	0.24	(1)	(1)	(1)	(1)	.....
Somerset, Mass.	6.00	4.12	4.91	4.83	2.93	3.56	4.65	4.03	0.94	2.10	3.40	5.67	47.14
Somersville, N. J.	4.68	4.63	8.73	2.12	2.88	6.20	4.44	2.44	0.26	2.92	5.85	5.78	45.98
Southington, Conn.	4.18	4.76	3.49	3.05	2.46	2.06	4.08	1.48	0.53	2.85	2.85	6.45	40.44
South Orange, N. J.	6.00	4.85	4.28	2.35	3.30	6.02	5.05	7.23	0.15	2.90	3.30	5.40	50.83
Spiceland, Ind.	(1)	(1)	(1)	(1)	4.23	2.11	2.08	0.40	4.25	1.81	1.31	6.47	.....
Springfield, Ark.	4.15	10.15	(1)	4.39	(1)	1.14	1.67	0.42	(1)	(1)	(1)	(1)	.....
Springfield, Mo.	(1)	(1)	(1)	(1)	5.48	2.67	9.22	3.17	3.80	1.73	3.03	7.62	.....
Stateburg, S. C.	4.43	3.29	3.53	3.66	3.97	4.81	1.70	3.29	6.67	0.91	1.18	5.87	42.58
State College, Pa.	3.37	3.56	4.29	1.73	2.37	1.67	3.08	1.65	(1)	1.66	2.17	.....	.....
Stateville, N. C.	6.06	(1)	12.03	4.40	2.63	7.99	2.96	1.39	0.50	0.92	1.71	5.35	.....
Station Albina, S. A.	(1)	(1)	(1)	(1)	17.18	10.36	10.43	0.70	0.00	0.00	0.69	(1)	.....
Sterling, Kans.	(1)	(1)	(1)	(1)	(1)	(1)	4.75	3.14	(1)	0.82	0.98	1.16	.....
Stockham, Nebr.	0.80	(1)	1.00	5.00	4.10	1.10	5.70	(1)	1.70	2.35	0.10	(1)	.....
Stratford, Vt.	3.00	4.70	5.20	2.10	4.55	1.80	3.15	4.40	0.70	1.70	4.40	8.80	38.80
Sumner, Ind.	2.00	7.48	2.11	2.40	3.82	2.89	2.65	2.02	5.85	1.04	1.03	3.38	36.67
Somerset, Wis.	(1)	(1)	1.91	3.61	3.11	3.70	5.64	3.14	2.70	3.01	1.97	4.78	.....
Swanwick, Ill.	1.15	6.18	2.75	2.12	4.84	5.96	1.90	1.84	2.85	(1)	(1)	5.78	.....
Swartz Creek, Mich.	1.09	3.00	3.99	2.07	3.17	3.50	5.24	0.95	2.01	4.69	1.91	3.19	34.81
Sycamore, Ill.	0.71	2.15	2.02	4.06	3.18	4.53	8.84	3.43	3.46	5.76	2.48	4.14	44.76
Tamaqua, Pa.	2.73	(1)	(1)	3.29	4.35	3.74	6.98	7.13	1.86	2.24	2.90	7.40	.....
Taunton, Mass.	4.35	4.84	5.38	4.12	2.73	4.04	4.13	4.52	3.25	3.63	5.31	46.98	.....
Tecumseh, Nebr.	(1)	(1)	(1)	(1)	(1)	4.94	9.03	4.20	0.96	3.03	0.02	0.60	.....
Terre Haute, Ind.	0.89	5.17	2.20	3.68	3.82	5.70	7.11	1.23	4.43	1.59	2.27	5.60	43.66
Thornville, Mich.	1.77	4.08	3.37	1.97	(1)	3.76	4.30	1.47	8.30	5.84	1.50	3.07	.....
Topeka, Kans.	0.65	2.88	3.19	4.88	3.51	5.18	5.37	5.86	6.88	2.87	1.23	1.62	42.62
Traverse City, Mich.	3.19	3.07	2.29	2.12	2.11	2.79	5.78	2.35	4.50	5.74	2.86	5.70	42.50
Troy, Pa.	4.32	2.25	3.85	2.88	4.19	2.63	4.76	3.00	0.77	2.07	2.03	3.28	36.13
Tucson, Ariz.	(1)	(1)	(1)	(1)	0.23	0.23	0.32	1.15	0.30	2.24	0.84	4.72	.....
Variety Mills, Va.	4.49	7.12	8.78	2.21	2.94	5.83	3.96	2.03	0.04	0.96	2.24	4.74	44.84
Vermillion, Dak.	(1)	(1)	1.50	3.42	1.68	(1)	(1)	(1)	(1)	2.18	(1)	0.70	.....
Vevay, Ind.	3.02	10.29	1.37	1.90	5.17	4.20	3.41	0.54	5.33	0.95	1.13	3.83	41.17
Vinceland, N. J.	11.56	6.78	6.59	(1)	1.99	(1)	3.86	2.63	0.47	0.80	2.81	6.58	.....
Volantown, Conn.	5.60	6.30	4.25	2.45	2.90	5.20	6.40	5.90	1.80	0.90	3.10	8.00	53.00
Wabash, Ind.	1.29	4.48	2.05	2.84	4.69	2.23	4.79	2.18	2.89	3.73	1.64	5.64	37.37
Washington City	5.02	6.15	6.50	1.59	2.84	6.17	6.30	0.58	0.22	1.53	3.23	4.63	44.26
Wausau, Wis.	(1)	(1)	1.20	2.41	1.91	4.03	3.17	4.62	12.03	4.31	1.65	3.70	.....
Wauseon, Ohio	1.93	5.02	2.78	1.42	3.95	2.79	4.20	1.12	1.85	3.01	1.46	3.38	32.91
Webster, Dak.	1.42	7.46	5.30	3.78	9.19	8.01	14.65	6.41	1.48	5.09	0.92	1.52	65.18
Weir's Bridge, N. H.	2.80	4.87	4.63	8.83	(1)	0.80	4.94	4.08	0.95	2.42	3.14	3.67	.....
Weldon, N. C.	5.33	3.36	7.06	1.99	2.91	3.14	7.70	1.88	0.23	1.05	1.30	5.99	41.92
Wellington, Kans.	0.46	0.71	1.05	3.67	4.79	4.21	1.89	3.41	1.10	2.90	1.85	3.14	29.21
Wellborough, Pa.	3.09	10.18	(1)	2.31	9.36	4.68	8.67	1.95	3.20	3.02	6.61	6.39	.....
Wellburg, W. Va.	3.60	5.20	3.81	0.90	3.90	1.70	4.03	1.55	1.35	3.20	0.62	(1)	.....
Westborough, Mass.	5.25	7.12	5.11	4.29	3.66	3.75	3.58	(1)	1.13	2.38	2.95	5.49	.....
West Chester, Pa.	7.32	7.29	6.09	2.94	3.64	7.52	5.27	2.12	4.02	2.56	4.36	7.00	56.53
Westerville, Ohio	1.97	4.62	3.32	1.75	3.53	3.03	1.84	1.08	4.91	1.20	1.08	2.83	31.16
West Leavenworth, Kans.	(1)	(1)	6.80	(1)	15.70	(1)	9.50	5.60	7.00	5.00	1.45	1.93	.....
Westmoreland, Kans.	(1)	(1)	(1)	4.20	2.88	5.50	8.50	5.75	5.75	(1)	(1)	(1)	.....
White Plains, N. Y.	4.30	4.35	3.31	2.70	3.20	6.40	7.65	6.64	1.12	8.60	3.32	6.05	61.64
Wilkesbarre, Pa.	3.41	3.48	4.95	2.46	3.97	2.68	4.62	2.90	(1)	3.16	3.30	4.53	.....

¹ No record.

² Inappreciable.

Monthly and annual precipitation, from reports made by voluntary observers of the Signal Service, United States Army—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Williamstown, Mass.....	In. 1.75	In. 3.76	In. 3.89	In. 1.88	In. 2.51	In. 1.65	In. (1)	In. (1)	In. 0.58	In. 2.98	In. 2.00	In. 3.72	In.
Wilton Centre, Ill.....	(1)	(1)	(1)	(1)	(1)	(1)	3.14	3.31	3.62	5.45	1.48	4.84	.....
Wolfeborough, N. H.....	4.71	5.64	5.48	3.52	(1)	1.69	3.89	4.01	1.25	2.53	2.47	5.05	.....
Woodstock, Md.....	6.12	6.69	7.65	1.63	3.20	2.74	2.37	1.67	0.23	1.45	4.27	2.15	40.17
Woodstock, N. H.....	2.69	5.52	5.72	2.26	(1)	1.48	3.11	3.84	1.26	4.08	4.25	4.65	.....
Woodstock, Vt.....	3.23	3.62	4.43	2.31	3.00	1.53	2.35	2.12	(1)	2.04	4.25	4.08	.....
Worcester, Mass.....	5.04	6.23	2.37	4.20	2.50	4.05	4.07	2.73	0.81	2.34	2.27	5.75	43.37
Wyandotte, Kans.....	(1)	3.51	2.06	3.35	3.78	4.71	4.64	5.36	7.10	4.07	1.15	1.54	.....
Wytheville, Va.....	3.92	5.33	3.04	2.65	3.41	5.92	2.76	1.33	0.90	0.88	1.31	3.02	39.10
Wytheville, Va*.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1.00	0.60	(1)	(1)	(1)	.....
Yates Centre, Kans.....	0.48	1.94	1.09	3.36	1.35	2.46	2.85	1.51	5.63	3.33	1.62	2.26	28.68
Yutan, Nebr.....	(1)	(1)	(1)	(1)	(1)	(1)	3.19	5.23	5.06	4.06	0.02	(1)	.....

¹ No record.

* Three and one-half miles from.

APPENDIX 32.

Monthly and annual precipitation at military post hospitals for the year ending December 31, 1884.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Abraham Lincoln, Fort, Dak...	In. 1.00	In. 0.68	In. 0.72	In. 1.88	In. 2.00	In. 5.16	In. 3.80	In. 4.18	In. 2.80	In. 1.20	In. 0.80	In. 1.60	In. 25.32
Alcatraz Island, Cal.	3.10	3.96	6.02	7.84	0.20	2.11	0.01	0.25	0.80	0.97	0.05	4.50	28.81
Angel Island, Cal.	4.05	6.85	7.82	6.67	0.12	2.66	(¹)	0.06	0.25	2.71	0.85	7.86	89.89
Assinaboine, Fort, Mont	0.16	0.42	0.53	0.25	3.05	3.95	0.00	2.59	2.74	0.41	0.42	0.78	15.80
Barranca, Fort, Fla.	7.06	8.40	6.25	6.95	9.75	11.99	11.80	2.89	(¹)	(¹)	(¹)	2.46	...
Benicia Barracks, Cal.	3.61	4.57	7.93	4.16	0.10	2.47	0.00	0.03	0.15	1.07	0.01	7.19	31.29
Bidwell, Fort, Cal.	1.14	2.96	6.67	0.68	0.40	4.29	0.67	0.08	1.55	0.78	(¹)	6.38	25.45
Brady, Fort, Mich.	0.78	1.23	0.69	1.27	2.73	1.43	3.14	4.29	7.00	4.35	1.25	3.32	31.42
Bridger, Fort, Wyo.	0.36	0.48	0.88	0.37	1.00	0.10	0.50	2.90	0.74	0.18	0.08	0.25	7.24
Brown, Fort, Tex.	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	0.08	0.48	7.50	0.17	1.18	0.80	...
Buford, Fort, Dak.	0.11	0.13	0.10	0.82	0.14	0.24	1.94	0.25	0.18	0.12	1.32	2.04	7.38
Columbus, Fort, N. Y. H.	5.48	5.05	4.52	(¹)	4.12	5.45	7.20	8.72	0.22	3.36	3.02	6.44	...
Concho, Fort, Tex.	0.40	0.80	0.50	0.60	0.83	1.77	2.20	0.96	6.44	1.16	1.50	5.85	36.21
David's Island, N. Y.	3.59	3.00	3.29	1.35	3.42	3.78	2.96	5.06	0.83	4.45	2.60	6.02	39.65
Ellis, Fort, Mont.	1.25	0.75	0.82	1.81	2.98	3.50	2.48	1.10	4.65	1.38	0.00	1.80	22.02
Fred Steele, Fort, Wyo.	(¹)	(¹)	1.80	0.96	2.92	0.30	0.14	0.70	0.24	0.68	0.16	1.10	...
Gaston, Fort, Cal.	5.49	5.16	7.90	6.89	1.30	1.50	1.02	0.00	2.28	1.08	0.84	14.49	46.95
Hamilton, Fort, N. Y. H.	7.53	8.06	4.22	3.16	4.49	4.75	3.65	10.44	0.46	3.41	8.01	5.40	56.18
Keogh, Fort, Mont.	(¹)	0.37	0.30	1.20	(¹)	(¹)	2.62	1.76	0.46	0.14	0.26	0.24	...
Klamath, Fort, Oreg.	2.63	1.88	3.02	1.76	0.74	3.14	0.84	(¹)	0.88	1.22	(¹)	8.68	...
Lewis, Fort, Colo.	0.25	3.41	4.24	(¹)	1.08	1.24	0.24	2.86	1.15	2.10	(¹)	4.30	...
Lyon, Fort, Colo.	(¹)	(¹)	0.40	1.10	3.11	1.60	2.20	1.70	0.20	0.79	0.20	(¹)	...
Madison Barracks, N. Y.	2.86	2.37	2.45	0.54	3.25	0.99	3.98	(¹)	2.69	2.63	2.49	2.68	...
Mason, Fort, Cal.	3.90	3.34	5.94	4.34	(¹)	2.00	0.00	0.00	(¹)	0.94	1.14	5.80	37.40
McDermitt, Fort, Nev.	6.72	4.80	4.88	4.52	3.20	4.44	1.20	(¹)	1.69	1.05	0.00	1.88	34.38
McDowell, Fort, Ariz.	0.14	4.37	3.47	0.06	0.45	0.69	(¹)	1.18	8.10	(¹)	0.48	4.14	...
McHenry, Fort, Md.	5.88	5.89	5.42	1.86	2.49	3.04	7.80	1.62	(¹)	0.98	3.91	3.90	42.39
Meade, Fort, Dak.	0.37	0.33	2.26	5.04	8.58	0.48	1.20	2.30	0.23	0.75	0.53	0.90	22.97
Mojave, Fort, Ariz.	0.00	1.90	(¹)	0.67	0.29	0.00	(¹)	0.00	0.00	0.07	0.00	5.69	...
Monroe, Fort, Va.	5.10	3.56	6.63	1.42	1.58	3.99	(¹)	3.12	0.16	0.20	0.58	3.02	...
Mount Vernon Barracks, Ala.	5.45	4.76	14.68	5.61	5.79	7.75	5.61	4.98	1.15	5.76	4.73	3.10	69.37
Niagara, Fort, N. Y.	2.25	2.75	2.27	0.71	(¹)	1.16	1.51	0.55	0.70	0.85	9.77	1.76	...
Pembina, Fort, Dak.	0.10	0.80	1.81	1.86	1.25	(¹)	(¹)	(¹)	(¹)	(¹)	2.25	2.62	...
Plattsburg Barracks, N. Y.	1.88	1.84	3.49	1.08	2.29	1.60	1.98	2.19	1.69	2.42	2.08	1.26	23.75
Presidio, Cal.	3.64	4.12	5.88	5.10	0.14	1.98	(¹)	0.00	0.30	2.18	0.19	(¹)	...
Randall, Fort, Dak.	0.58	0.47	2.98	2.80	1.70	4.31	2.32	2.89	0.04	0.97	0.04	1.08	19.68
Reno, Fort, Ind. T.	0.46	0.18	(¹)	3.64	6.79	4.44	2.21	3.22	3.91	4.66	3.88	2.50	...
Robinson, Fort, Nebr.	0.40	0.50	(¹)	1.49	2.85	1.53	2.25	1.00	0.50	0.34	0.16	(¹)	...
Saint Augustine, Fla.	1.67	3.42	1.92	2.14	1.73	7.43	3.54	10.02	1.71	1.05	3.87	1.87	40.87
Shaw, Fort, Mont.	0.83	0.62	0.41	0.59	0.74	0.97	2.66	0.59	2.29	0.39	0.84	(¹)	...
Sisseton, Fort, Dak.	0.35	0.82	0.82	1.26	3.00	1.32	3.45	4.27	1.43	3.63	0.52	1.31	22.18
Snelling, Fort, Minn.	(¹)	1.84	0.86	1.88	2.42	5.42	2.10	3.61	5.51	2.37	0.45	1.41	...
Spokane, Fort, Wash.	0.80	1.02	0.42	1.30	(¹)	1.52	0.82	0.20	1.56	1.18	(¹)	(¹)	...
Sully, Fort, Dak.	0.29	0.47	0.87	2.28	2.04	3.00	2.57	0.72	0.76	1.04	0.17	0.63	14.84
Totten, Fort, Dak.	0.68	0.54	0.96	2.90	0.98	1.89	1.92	5.94	1.98	0.98	0.25	0.63	19.67
Townsend, Fort, Wash.	2.86	1.77	0.11	2.10	0.97	2.23	0.86	2.02	0.24	2.14	0.39	1.57	18.56
Union, Fort, N. Mex.	0.18	0.54	0.28	0.28	4.93	3.06	0.76	7.80	1.08	(¹)	(¹)	(¹)	...
West Point, N. Y.	(¹)	(¹)	(¹)	3.80	3.80	2.50	8.40	(¹)	1.00	(¹)	5.00	6.20	...
Wingate, Fort, N. Mex.	(¹)	0.50	(¹)	(¹)	1.04	1.18	1.78	4.64	0.70	1.66	(¹)	0.74	...
Yates, Fort, Dak.	0.23	0.85	0.29	1.50	0.94	5.00	3.90	4.90	1.94	0.39	0.54	0.50	20.38

¹No record.²Inappreciable.

APPENDIX 33.

Monthly and annual precipitation at stations on the Central Pacific and Southern Pacific Railroads and connecting branches for the year ending December 31, 1884.

[Copied from the records on file at the office of the chief engineer C. P. R. R.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Alta, Cal	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Anaheim, Cal	2.80	10.58	6.70	1.75	0.54	1.28	0.00	0.00	0.00	0.15	0.64	3.17	28.16
Antioch, Cal	8.50	8.84	5.73	2.62	0.00	1.15	0.00	(¹)	(²)	1.25	(³)	2.49	30.78
Aptos, Cal	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	0.00	(¹)	1.25	(³)	0.00	11.34
Auburn, Cal	5.33	7.63	10.17	8.02	0.85	1.23	0.00	0.00	0.56	2.25	0.00	16.37	82.41
Battle Mountain, Nev	0.70	0.23	1.04	1.54	1.29	2.18	0.00	0.10	1.12	1.94	0.00	1.82	11.46
Benson, Ariz	0.20	0.63	1.20	(³)	0.00	(¹)	0.70	0.27	0.30	2.89	(¹)	0.00	5.00
Besowawe, Nev	0.75	1.60	0.96	0.77	1.29	2.25	0.00	0.00	0.93	0.58	0.00	1.84	10.97
Bishop Creek, Nev	(¹)	(¹)	0.94	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00
Blue Creek, Utah	1.14	0.70	(¹)	2.16	1.01	0.52	0.00	0.00	1.80	0.50	0.10	2.50	10.97
Boca, Cal	4.60	6.30	5.10	1.90	0.80	1.40	0.00	0.00	0.00	0.60	0.00	8.20	28.10
Borden, Cal	1.99	4.48	8.29	2.47	1.77	1.73	0.00	0.00	0.00	0.16	0.00	4.74	20.65
Brentwood, Cal	2.62	3.84	4.18	2.22	(³)	1.51	0.00	0.00	(³)	1.20	0.00	2.69	18.25
Brighton, Cal	2.08	3.68	5.32	3.54	0.25	1.55	0.00	0.00	0.23	1.42	0.00	6.17	24.24
Brown's, Nev	0.56	0.68	0.36	0.72	0.11	0.49	0.15	0.00	0.06	1.36	0.00	0.51	5.00
Byron, Cal	2.41	4.15	5.61	2.50	0.00	1.54	0.00	0.00	0.00	1.23	0.00	2.83	20.77
Cabazon, Cal	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	0.00	0.00	0.00	0.00	2.05	2.05
Caliente, Cal	2.00	4.98	5.00	2.90	1.10	1.28	0.00	0.00	0.00	0.22	0.25	8.25	20.86
Calistoga, Cal	6.57	4.42	9.78	5.98	0.42	2.06	0.00	0.00	0.19	1.83	0.15	15.08	48.38
Carlin, Nev	1.20	1.79	1.82	1.42	1.58	1.85	0.07	0.26	0.74	1.37	0.00	2.89	14.39
Casa Grande, Ariz	0.75	(¹)	1.08	0.00	0.00	(¹)	0.00	0.37	0.00	1.31	0.00	3.20	3.20
Chico, Cal	2.48	2.16	5.57	2.93	0.40	2.11	0.00	0.00	0.86	1.40	0.00	5.28	23.19
Chualar, Cal	1.72	(¹)	5.17	2.73	(³)	1.78	0.00	(¹)	0.07	2.08	0.24	2.79	2.79
Cisco, Cal	8.40	12.00	14.65	10.10	0.00	8.54	0.00	0.00	0.00	2.32	0.00	25.05	76.08
Colfax, Cal	7.54	9.73	12.27	10.94	1.38	8.01	0.00	(³)	0.80	2.55	(³)	23.00	71.82
Colton, Cal	1.00	11.38	4.05	2.85	2.90	0.82	0.00	0.25	0.00	0.25	0.12	8.93	27.05
Corinne, Utah	0.55	1.90	3.80	2.10	1.75	0.70	0.20	0.30	2.90	1.05	0.05	8.65	18.95
Daggett, Cal	0.48	1.44	1.17	0.10	0.49	0.00	0.00	0.00	(¹)	.....	.....	.....	.....
Davisville, Cal	3.07	3.78	5.09	3.07	0.00	1.39	0.00	0.00	0.28	1.48	0.00	6.25	26.41
Delano, Cal	1.61	2.38	1.98	2.31	(³)	0.22	0.00	0.00	0.00	0.00	0.16	2.16	2.16
Delta, Cal	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	6.01	0.56	16.14	16.14
Deming, N. Mex	0.81	0.70	0.20	0.20	0.00	0.00	0.52	1.04	0.80	1.53	(¹)	1.85	1.85
Dunnigan, Cal	3.26	3.21	5.78	2.78	(³)	2.60	0.00	0.00	0.04	1.28	0.00	7.16	24.10
Elko, Nev	1.20	1.00	1.40	0.72	0.65	1.27	(¹)	0.00	1.00	0.59	0.00	3.41	3.41
El Paso, Tex	0.25	0.20	0.12	0.07	0.00	(¹)	0.00	1.56	(¹)	(¹)	0.05	0.57	0.57
Emigrant Gap, Cal	8.22	10.20	15.18	10.84	2.10	2.77	0.00	0.00	0.51	1.33	0.00	31.20	62.95
Farmington, Cal	1.44	5.04	6.53	4.72	0.85	1.82	0.00	0.00	0.09	1.15	0.00	6.31	26.85
Fenner, Cal	0.15	1.30	1.25	0.15	1.09	0.05	0.00	(¹)	0.00	(³)	.....	.....	.....
Fresno City, Cal	2.29	3.18	2.81	2.65	1.11	1.29	0.00	(¹)	0.00	0.35	0.08	3.98	3.98
Galt, Cal	1.70	4.09	5.46	2.69	0.58	1.86	0.00	0.00	0.00	1.31	0.00	6.06	22.65
Gilroy, Cal	2.94	6.65	7.24	3.80	0.34	1.24	0.00	0.11	0.12	1.73	0.06	8.83	33.06
Golconda, Nev	0.69	0.78	1.81	1.91	1.51	(¹)	0.00	0.10	0.57	0.44	0.00	1.12	1.12
Goshen, Cal	1.56	3.80	1.71	1.97	0.54	(¹)	0.00	0.00	0.00	0.36	0.00	3.75	3.75
Halleck, Nev	0.60	0.72	1.99	1.80	1.03	0.56	0.03	0.14	(¹)	0.30	0.00	1.33	1.33
Hawthorne, Nev	(¹)	(¹)	(¹)	0.18	0.69	0.89	0.00	0.10	0.00	0.05	0.00	0.52	0.52
Hollister, Cal	1.05	3.80	4.38	2.66	0.62	1.85	0.00	0.05	0.00	1.30	0.00	6.32	12.33
Hot Springs, Nev	0.70	0.80	(¹)	0.44	0.29	1.28	0.04	0.08	0.00	0.83	0.00	0.50	0.50
Humboldt, Nev	1.20	0.75	0.39	0.51	0.00	(¹)	0.00	(¹)	0.00	1.28	0.00	0.51	0.51
Indio, Cal	0.00	8.16	0.62	0.44	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.66
Ione, Cal	2.81	6.13	7.87	6.51	0.39	2.03	0.00	0.00	0.00	1.82	0.00	8.22	33.78
Keeler, Cal	(¹)	(¹)	(¹)	0.20	1.60	0.80	0.00	0.20	0.00	0.00	0.00	0.70	0.70
Keene, Cal	2.14	7.46	4.80	3.16	3.23	1.79	0.00	0.00	(³)	2.55	0.36	5.22	30.71
Kelton, Utah	0.05	0.72	2.20	1.80	0.81	0.85	0.15	0.34	1.97	(¹)	0.00	8.35	8.35
Kingsburg, Cal	2.47	4.09	4.09	2.17	1.00	0.82	0.00	0.00	0.00	0.26	0.09	4.56	19.65
Knight's Landing, Cal	3.68	3.53	4.88	3.15	0.00	1.89	0.00	(¹)	0.25	1.45	0.00	5.56	5.56
Lathrop, Cal	1.14	4.17	4.86	2.57	0.56	1.02	0.00	(¹)	0.10	0.82	0.00	2.87	2.87
Leimooore, Cal	1.59	3.21	3.40	3.25	0.40	1.49	0.00	0.00	(¹)	0.25	0.20	8.77	8.77
Livermore, Cal	4.03	5.29	5.92	2.70	0.20	1.73	0.00	0.10	0.30	1.14	0.02	6.23	27.65
Lordsburg, N. Mex	0.80	0.13	2.10	0.20	(³)	0.00	2.20	1.30	2.35	2.55	0.00	1.46	12.09
Los Angeles, Cal	3.02	10.74	9.85	3.15	0.70	1.80	0.00	0.00	0.00	0.30	0.85	4.21	34.12
Mammoth Tank, Cal	(³)	1.86	0.22	0.07	0.19	0.00	0.00	(³)	0.00	0.00	0.00	0.87	2.71

¹ No record.

² Record incomplete.

³ Inappreciable.

⁴ Observations discontinued.

Monthly and annual precipitation at stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Maricopa, Ariz.....	1.05	3.58	2.20	0.10	0.00	(¹)	(¹)	0.00	0.40	3.43	0.08	2.08	.....
Martinez, Cal.....	3.57	4.65	7.97	3.17	0.00	2.00	0.00	0.00	0.13	1.13	0.00	4.76	27.38
Marysville, Cal.....	2.49	2.82	3.81	2.57	0.00	1.18	0.00	0.00	0.09	1.74	0.00	4.24	18.44
Menlo Park, Cal.....	3.35	4.07	4.80	2.76	0.00	3.16	0.00	0.05	0.04	(¹)	0.27	4.92	.....
Merced, Cal.....	1.64	4.39	5.38	5.60	0.86	1.73	0.00	0.00	0.00	0.54	0.02	3.63	23.79
Modesto, Cal.....	0.75	2.01	3.89	2.85	0.15	0.99	0.00	(¹)	0.00	1.20	0.00	2.62	.....
Mojave, Cal.....	1.77	0.77	2.17	(¹)	0.00	0.00	0.00	0.10	(¹)	0.13	(¹)	(¹)	.....
Monterey, Cal.....	2.60	4.34	6.08	3.75	0.36	1.80	0.00	0.07	0.03	1.81	0.30	5.33	26.47
Napa City, Cal.....	3.02	3.89	5.72	0.00	0.13	2.12	0.00	0.00	(¹)	0.70	0.00	10.16	.....
Needles, Ariz.....	0.00	1.86	2.08	0.10	0.75	0.00	0.00	0.00	0.00	(⁴)	.....	.....	.....
Newhall, Cal.....	6.66	14.53	9.73	3.85	2.17	1.67	0.00	0.00	0.00	0.60	1.10	3.89	44.20
Niles, Cal.....	3.78	6.18	5.41	3.74	0.18	2.69	0.00	0.00	0.34	1.30	0.00	5.75	29.37
Oakland, Cal.....	2.03	4.46	3.18	4.58	0.30	2.83	0.00	0.00	0.20	2.77	0.00	6.10	32.35
Ogden, Utah.....	0.77	2.21	3.63	3.85	1.51	0.61	0.00	0.08	2.41	1.46	0.00	2.96	19.49
Orland, Cal.....	3.38	1.58	4.81	2.97	0.23	2.55	0.00	0.00	0.20	0.80	0.00	4.03	20.05
Otego, Nev.....	1.05	0.85	1.20	1.01	1.26	1.21	0.04	0.60	0.42	1.03	0.00	3.15	12.72
Pajaro, Cal.....	2.68	6.33	5.83	3.61	0.32	1.47	0.00	0.15	1.09	1.92	0.20	7.45	30.14
Palmdale, Nev.....	0.89	1.00	2.17	1.50	1.80	1.72	0.05	0.22	1.00	1.60	0.00	2.07	13.10
Pantano, Ariz.....	0.81	1.64	0.63	0.00	0.33	(¹)	0.40	2.60	1.45	2.80	0.85	4.70	.....
Petaluma, Cal.....	4.85	3.96	4.86	5.53	0.31	2.80	0.00	0.02	0.13	(¹)	0.12	8.07	.....
Pleasanton, Cal.....	3.41	6.18	6.53	3.14	0.05	1.78	0.00	0.09	0.08	0.99	0.00	4.47	28.72
Promontory, Utah.....	0.90	1.75	1.08	4.37	1.42	1.02	0.00	0.00	2.17	0.56	(¹)	1.40	.....
Ravenna, Cal.....	4.58	9.50	6.06	2.15	0.20	1.65	0.00	0.25	0.10	0.30	0.30	3.00	28.59
Red Bluff, Cal.....	3.78	2.69	7.99	4.36	0.25	1.24	0.00	0.00	0.20	1.00	0.00	8.00	29.37
Redding, Cal.....	5.45	3.34	(¹)	2.65	0.00	0.00	0.00	(¹)	0.02	1.38	0.00	14.51	.....
Reno, Nev.....	1.70	1.25	1.80	0.35	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.77	6.17
Rocklin, Cal.....	3.27	4.58	5.77	4.19	0.00	1.20	0.00	0.00	(¹)	1.85	(¹)	7.75	.....
Sacramento, Cal.....	2.71	3.85	6.50	8.60	0.00	1.35	0.00	(²)	0.48	1.80	0.00	7.40	27.69
Salinas, Cal.....	1.52	4.03	4.69	2.87	0.71	2.54	0.00	0.09	0.14	1.81	0.18	4.28	23.46
San Fernando, Cal.....	3.00	10.80	10.51	3.48	1.05	(¹)	0.00	0.00	0.00	0.42	(¹)	4.96	.....
San José, Cal.....	3.18	3.88	6.23	3.88	0.05	2.15	0.00	0.00	0.08	(¹)	0.06	3.90	.....
San Mateo, Cal.....	3.40	4.68	6.38	3.40	0.05	2.91	0.00	(¹)	0.17	1.78	0.21	7.59	.....
San Simon, Ariz.....	0.40	0.60	2.21	0.00	0.34	0.08	1.21	2.47	0.40	1.63	0.00	1.03	10.37
Santa Cruz, Cal.....	2.30	5.27	3.78	6.78	0.11	2.48	0.00	0.10	0.33	1.37	0.32	8.91	87.73
Soledad, Cal.....	2.74	4.24	3.74	1.67	1.13	1.56	0.00	0.10	0.00	1.78	0.30	1.74	19.00
South Vallejo, Cal.....	2.52	3.21	6.08	3.14	0.00	1.74	0.00	0.00	(¹)	1.09	0.00	6.03	.....
Spadra, Cal.....	2.90	8.80	7.00	2.25	0.55	0.75	0.00	0.00	(²)	0.00	0.81	2.82	25.88
Stockton, Cal.....	1.68	4.02	5.77	2.65	0.31	1.05	0.00	0.00	(¹)	1.58	0.00	5.49	.....
Suisun City, Cal.....	2.64	4.48	6.33	3.78	0.30	1.69	0.00	(¹)	(¹)	0.70	0.00	7.48	.....
Summit, Cal.....	7.60	12.70	9.10	12.60	0.80	4.04	0.00	0.00	0.00	3.18	0.00	9.40	59.37
Summer, Cal.....	1.48	2.20	1.06	1.27	1.74	0.80	0.00	0.00	0.00	0.00	0.40	3.35	12.40
Tecoma, Nev.....	0.10	0.87	0.93	2.16	1.10	0.50	0.10	0.10	1.83	0.88	(¹)	1.69	.....
Tehama, Cal.....	3.15	2.08	4.94	2.61	(¹)	1.55	0.00	0.00	(¹)	0.69	0.00	(²)	.....
Tehichipa, Cal.....	1.54	7.26	3.46	1.85	1.26	1.05	0.00	0.64	0.00	0.13	0.29	2.76	20.24
Tennant, Cal.....	5.23	5.96	10.09	4.19	0.14	1.42	0.00	0.22	0.27	1.76	0.12	8.11	37.51
Terrace, Utah.....	0.70	0.90	1.58	1.74	1.02	0.46	0.03	0.05	1.61	(¹)	0.00	1.38	.....
Texas Hill, Ariz.....	0.22	1.81	1.75	0.23	0.28	0.00	(¹)	0.00	0.02	0.00	0.00	1.31	.....
Toano, Nev.....	0.70	0.78	0.68	1.87	1.60	0.55	0.00	0.13	0.80	1.25	0.00	2.20	10.56
Tracy, Cal.....	0.90	3.43	3.27	1.65	0.10	2.05	0.00	0.10	0.00	0.82	0.00	2.49	14.81
Truckee, Cal.....	6.65	11.20	5.38	3.90	0.06	1.02	0.00	0.00	(¹)	1.50	0.00	13.24	.....
Tucson, Ariz.....	0.08	3.30	0.14	0.20	0.00	0.10	0.85	0.70	0.45	1.50	0.70	3.90	4.72
Tulare, Cal.....	1.16	2.97	2.64	1.97	0.48	1.02	0.00	0.00	0.00	0.16	0.08	2.61	13.09
Turlock, Cal.....	1.47	2.94	2.00	2.20	0.73	1.93	0.00	0.00	0.08	0.85	0.00	2.46	14.66
Wadsworth, Nev.....	0.25	0.50	0.98	0.00	0.27	1.40	0.05	0.03	0.05	0.00	0.00	0.85	4.37
Wells, Nev.....	0.70	0.70	1.17	1.14	1.48	1.57	0.00	0.17	0.23	2.80	0.00	1.80	11.76
Willcox, Ariz.....	0.64	2.44	1.86	0.02	0.07	0.11	1.25	1.38	(²)	3.49	0.21	2.99	14.46
Williams, Cal.....	3.01	1.53	3.93	1.96	(²)	2.96	0.00	0.00	0.33	0.45	0.00	4.27	18.44
Willow, Cal.....	5.42	3.11	4.80	2.58	0.12	0.90	0.00	0.00	0.13	0.69	0.00	4.18	21.93
Winnemucca, Nev.....	1.05	1.00	5.23	1.53	2.19	1.83	0.32	0.00	0.00	1.92	0.00	5.82	20.90
Woodland, Cal.....	3.47	3.44	4.69	3.83	0.00	(¹)	0.00	0.00	(¹)	(¹)	0.00	4.63	.....
Yuma, Ariz.....	(²)	1.11	1.48	0.07	0.27	(¹)	0.00	(²)	(¹)	0.00	0.00	1.91	.....

¹ No record.² Record incomplete.³ Inappreciable.⁴ Observations discontinued.

APPENDIX 34.

Precipitation at the cotton-region stations of the Signal Service, United States Army, for the months July to October, 1884, inclusive, and May and June, 1885.

Stations.	1884.				1885.	
	July.	August.	September.	October.	May.	June.
Wilmington, N. C.:	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
Charlotte, N. C.	7.82	2.18	3.57	1.51	6.48	2.48
Cheraw, S. C.	8.34	2.97	3.51	0.28	5.53	4.98
Florence, S. C.	8.61	1.78	5.41	0.12	4.71	4.04
Goldsbrough, N. C.	8.98	4.28	2.53	0.88	5.87	5.31
Lumberton, N. C.	4.47	5.81	6.08	0.11	6.46	7.67
New Bern, N. C.	3.57	7.38	3.18	0.41	10.86	5.17
Raleigh, N. C.	8.82	3.57	0.78	0.69	7.00	0.99
Salisbury, N. C.	1.85	1.07	0.26	0.97	6.85	8.60
Wadesborough, N. C.	7.98	1.45	1.50	0.25	8.97	1.78
Weldon, N. C.	7.97	2.52	0.08	1.21	8.59	1.85
Wilmington, N. C.	8.73	9.06	9.85	0.62	8.58	8.39
Charleston, S. C.:						
Branchville, S. C.	5.21	5.07	4.27	0.03	1.03	5.47
Charleston, S. C.	9.34	6.80	11.03	0.35	2.20	5.94
Hardeeville, S. C.	4.08	9.24	5.65	0.20	4.73	12.96
Jacksonborough, S. C.	11.28	8.48	2.13	0.45	3.08	5.96
Kingston, S. C.	6.63	5.01	6.56	0.03	5.96	5.64
Saint George's, S. C.	8.52	2.42	5.44	0.00	2.78	4.85
Saint Matthew's, S. C.	4.79	4.10	4.93	0.00	4.51	5.57
Yemassee, S. C.	6.88	6.61	6.01	0.22	5.67	6.29
Augusta, Ga.:						
Allendale, S. C.	3.97	5.49	4.19	0.00	5.77	4.12
Athens, Ga.	7.02	2.94	0.00	0.52	6.96	4.01
Augusta, Ga.	3.41	4.35	4.23	0.83	5.87	12.80
Batesburg, S. C.	4.45	5.14	5.00	0.00	4.50	5.29
Blackville, S. C.	3.90	4.28	6.49	0.27	2.64	7.20
Camak, Ga.	2.62	2.04	0.64	0.27	6.04	5.22
Chester, S. C.	1.40	0.42	3.25	0.00	1.71	2.46
Columbia, S. C.	2.48	3.53	5.09	0.00	9.21	4.90
Greenwood, S. C.	5.82	4.06	1.49	0.24	4.09	4.18
Union Point, Ga.					3.65	2.47
Washington, Ga.	2.31	1.26	0.70	1.48	8.42	4.33
Waynesborough, Ga.	2.80	4.88	3.15	0.00	4.79	3.49
Savannah, Ga.:						
Albany, Ga.	8.57	3.75	0.88	0.00	5.07	3.32
Allapaha, Ga.	6.23	6.74	1.30	0.00	4.09	1.74
Bainbridge, Ga.	0.84	0.85	0.15	0.00	0.44	0.31
Oedar Keys, Fla.	6.02	8.11	3.63	0.13	3.48	10.96
Eastman, Ga.	(¹)	1.47	(¹)	0.00	0.19	0.15
Fernandina, Fla.	5.00	7.03	(¹)	1.00	5.21	3.97
Fort Gaines, Ga.	4.68	3.59	0.34	0.00	8.21	2.21
Jessup, Ga.	5.62	7.86	2.92	1.00	3.48	8.00
Live Oak, Fla.	3.77	3.72	0.50	0.27	5.58	6.97
Millen, Ga.	5.77	3.12	8.18	0.07	3.13	4.66
Quitman, Ga.	3.66	1.58	2.35	0.76	4.50	1.06
Savannah, Ga.	3.74	2.46	4.55	2.29	3.96	3.19
Smithville, Ga.	1.85	2.69	0.44	0.00	4.64	2.78
Thomasville, Ga.	5.14	2.05	1.06	0.22	3.08	6.15
Waldo, Fla.	0.74	4.93	(¹)	1.13	6.80	1.29
Way Cross, Ga.	4.36	10.12	2.60	0.70	5.15	4.35
Atlanta, Ga.:						
Anderson, S. C.	2.58	1.92	0.08	0.78	2.35	3.74
Atlanta, Ga.	2.46	2.08	0.08	0.70	6.31	4.53
Cartersville, Ga.	4.80	1.28	1.32	0.77	6.08	2.61
Columbus, Ga.	5.22	1.43	(¹)	0.03	6.01	3.53
Dalton, Ga.	6.51	1.79	1.37	0.93	7.25	6.16
Gainesville, Ga.	4.94	0.52	1.13	0.10	4.04	2.81
Greenville, S. C.	7.25	1.42	0.00	0.10	4.16	4.57
Griffin, Ga.	3.45	3.79	1.11	0.68	6.88	3.09

¹ No record.

² 26 days only.

³ 23 days only.

Precipitation at the cotton-region stations of the Signal Service, &c.—Continued.

Stations.	1884.				1885.	
	July.	August.	September.	October.	May.	June.
Atlanta, Ga.—Continued:	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
Macon, Ga.	4.03	1.87	0.13	0.32	5.18	3.35
Newnan, Ga.	3.54	2.74	0.11	0.52	6.69	3.29
Spartanburg, S. C.	3.83	1.61	0.75	0.06	4.83	3.09
Toccoa, Ga.	5.66	2.14	1.12	0.40	8.01	1.75
West Point, Ga.	3.23	4.11	0.06	0.60	4.59	5.83
Montgomery, Ala.:						
Birmingham, Ala.	5.29	1.74	0.10	1.01	6.48	3.49
Calera, Ala.	2.08	3.04	0.00	0.15	5.21	4.40
Enfauila, Ala.	8.98	3.88	0.14	0.03	3.02	1.96
Fort Deposit, Ala.	0.34	0.66	0.00	0.12	5.08	2.90
Greenville, Ala.	(¹)	2.78	0.25	1.03	14.45	0.16
Marion, Ala.	3.91	4.33	0.00	1.90	3.03	1.67
Montgomery, Ala.	3.10	3.05	0.58	1.87	8.92	4.32
Opelika, Ala.	5.88	1.47	0.29	0.56	7.13	3.33
Pine Apple, Ala.	3.88	3.25	0.60	1.09	3.95	2.38
Selma, Ala.	7.21	2.28	0.00	2.95	2.64	1.23
Mobile, Ala.:						
Aberdeen, Miss.	4.91	0.78	2.93	0.60	4.82	2.44
Columbus, Miss.	10.20	0.88	0.42	0.81	0.44	4.30
Evergreen, Ala.	7.53	2.87	(¹)	1.75	(¹)	(¹)
Livingston, Ala.	5.77	4.89	0.43	²¹ 2.26	²³ 3.68	(¹)
Macon, Miss.	5.12	1.25	0.40	0.50	7.31	0.15
Meridian, Miss.	0.03	0.15	0.01	0.13	(¹)	(¹)
Mobile, Ala.	4.96	1.26	1.78	5.36	3.27	4.15
Okalona, Miss.	6.90	1.30	0.06	0.90	5.23	2.50
Waynesborough, Miss.	6.98	2.46	0.55	2.05	3.13	2.50
New Orleans, La.:						
Alexandria, La.	4.71	0.62	4.70	3.45	3.56	2.56
Amite City, La.	1.13	3.52	0.94	5.02	0.09	0.11
Brookhaven, Miss.	0.43	4.18	2.28	1.73	0.84	4.07
Cheneyville, La.	1.45	1.06	3.17	3.25	2.88	3.62
Coushatta Chute, La.	1.36	1.68	1.81	2.10	2.86	3.82
Hazlehurst, Miss.	0.14	0.53	0.06	0.15	0.11	0.37
Lafayette, La.	4.57	1.89	2.55	4.10	5.84	4.11
Minden, La.	1.24	2.37	1.76	1.02	2.41	2.70
Natchez, Miss.	0.63	3.37	2.87	2.98	3.52	1.69
Natchitoches, La.	0.00	2.30	2.45	1.90	3.87	2.38
New Orleans, La.	4.12	0.87	3.12	5.90	5.77	3.80
Opelousas, La.	3.99	0.55	2.11	2.59	4.77	4.22
Shreveport, La.	0.06	1.99	2.10	0.53	3.70	5.77
Whiteville, La.	1.87	1.69	2.22	6.70	4.15	(²)
Galveston, Tex.:						
Austin, Tex.	(¹)	(¹)	2.34	(¹)	(¹)	0.37
Beaumont, Tex.	(¹)	²¹ 1.96	5.82	(¹)	(¹)	(¹)
Belton, Tex.	0.42	(¹)	3.77	(¹)	2.97	0.06
Columbia, Tex.	0.30	0.65	4.71	(¹)	5.20	0.87
Corsicana, Tex.	0.00	(¹)	0.04	(¹)	(¹)	3.36
Cuero, Tex.	0.00	0.32	2.29	(¹)	²⁴ 4.03	0.30
Dallas, Tex.	0.00	2.22	0.00	1.43	²⁶ 9.99	9.69
Galveston, Tex.	1.95	1.77	7.04	7.37	6.41	3.26
Hearne, Tex.	0.00	0.94	2.40	(¹)	9.54	0.00
Hempstead, Tex.	0.01	0.03	4.05	(¹)	(²)	.....
Houston, Tex.	1.61	1.33	10.02	5.23	4.55	2.43
Huntsville, Tex.	(¹)	0.33	2.81	(¹)	6.33	0.71
Longview, Tex.	0.03	1.01	3.16	(¹)	4.92	5.86
Luling, Tex.	(¹)	0.70	2.53	1.76	(¹)	0.00
Orange, Tex.	²⁰ 0.20	0.18	1.20	0.26	(¹)	0.10
Palestine, Tex.	0.06	0.66	3.99	1.45	6.08	2.07
San Antonio, Tex.	0.00	0.22	2.83	1.53	²⁰ 7.79	0.86
Sour Lake, Tex.	0.94	3.22	3.28	4.45	²³ 10	5.06
Tyler, Tex.	0.00	2.01	3.25	(¹)	2.08	1.24
Waco, Tex.	0.06	(¹)	1.10	(¹)	12.44	2.22
Weatherford, Tex.	(¹)	(¹)	0.29	(¹)	7.50	4.23
Weimar, Tex.	0.00	0.70	3.66	0.88	10.43	0.18
Vicksburg, Miss.:						
Edwards, Miss.	4.38	1.84	1.87	1.33	2.59	0.81
Jackson, Miss.	0.20	1.63	2.45	1.14	2.39	1.71
Lake, Miss.	5.88	6.80	1.90	1.89	3.86	2.45
Monroe, La.	3.83	3.48	1.46	1.55	3.43	4.10

¹ No record.² 24 days only.³ 25 days only.⁴ Record incomplete.⁵ Observations discontinued.²⁰ 20 days only.²⁷ 27 days only.¹⁸ 18 days only.²³ 23 days only.

Precipitation at the cotton-region stations of the Signal Service, &c.—Continued.

Stations.	1884.				1885.	
	July.	August.	September.	October.	May.	June.
Vicksburg, Miss.—Continued:	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Vicksburg, Miss.....	4.99	2.88	5.12	1.08	4.75	2.90
Little Rock, Ark.:						
Arkansas City, Ark.....	2.97	1.02	2.70	(¹)	(¹)	(²)
Brinkley, Ark.....	3.56	1.48	5.51	0.50	0.90	1.62
Devall's Bluff, Ark.....	3.60	1.20	3.50	1.19	4.23	2.71
Fort Smith, Ark.....	5.98	3.73	5.03	1.81	2.59	4.68
Helena, Ark.....	4.42	1.04	1.94	1.10	0.43	2.43
Kennett, Ark.....	3.40	2.20	8.00	1.45	1.24	3.96
Little Rock, Ark.....	4.23	3.26	5.00	1.80	3.26	3.39
Madison, Ark.....	4.40	0.50	4.30	0.60	1.00	1.30
Magnolia, Ark.....	3.00	3.73	2.53	0.65	1.85	5.74
Malvern, Ark.....	4.96	2.56	1.88	0.05	6.11	3.67
Monticello, Ark.....	2.61	2.37	3.30	1.10	5.05	2.55
Newport, Ark.....	1.20	0.91	7.91	1.14	1.09	2.00
Paris, Tex.....	0.48	1.28	1.95	(³)	2.52	2.54
Pine Bluff, Ark.....	2.04	0.78	2.87	1.14	3.15	2.45
Prescott, Ark.....	0.72	0.99	4.20	0.77	2.16	1.17
Russellville, Ark.....	(⁴) 4.12	0.33	7.88	(¹)	1.58	2.95
Texarkana, Ark.....	0.98	1.21	8.00	0.40	(¹)	4.03
Memphis, Tenn.:						
Batesville, Ark.....	7.23	2.48	1.91	1.85	1.45	3.06
Bolivar, Tenn.....	3.75	0.70	2.12	(¹)	2.40	5.95
Brownsville, Tenn.....	5.99	2.53	2.14	1.42	1.07	9.75
Corinth, Miss.....	3.06	2.40	0.83	2.90	0.38	0.38
Covington, Tenn.....	1.90	2.65	2.56	3.18	1.87	4.75
Decatur, Ala.....	6.47	1.53	0.29	1.81	5.92	4.76
Dyersburg, Tenn.....	4.83	2.61	3.75	3.04	3.25	7.12
Grand Junction, Tenn.....	5.11	1.21	1.24	2.43	2.26	6.56
Grenada, Miss.....	2.62	1.06	0.58	1.33	2.57	1.95
Hernando, Miss.....	5.88	2.73	2.41	1.69	0.60	4.03
Holly Springs, Miss.....	4.93	2.18	0.83	2.21	2.32	4.63
Memphis, Tenn.....	2.38	1.27	4.29	2.83	3.05	1.52
Milan, Tenn.....	3.28	1.11	4.83	1.61	3.17	5.19
Nashville, Tenn.....	3.16	2.73	2.31	2.38	4.32	3.70
Oxford, Miss.....	4.70	1.75	2.30	1.20	1.52	6.66
Paris, Tenn.....	2.83	1.31	5.26	4.59	2.99	5.25
Scottsborough, Ala.....	7.64	0.25	0.67	2.57	(⁴) 7.45	5.98
Tusculum, Ala.....	5.16	1.95	1.05	0.70	3.54	0.63
Withee, Tenn.....	(³)	0.27	0.79	0.80	0.15	0.30

¹ No record.

² Record incomplete.

³ 19 days only.

⁴ 26 days only.

APPENDIX 35.

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year. (Computed from the commencement of observations at each, to and including July, 1872.)

[The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11.35 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England:	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Mount Washington, N. H.	78.6	67.7	67.0	78.9	81.9	83.2	85.7	82.5	78.7	75.7	70.3	73.5	75.5
Boston, Mass.	65.4	63.6	66.8	61.9	60.6	69.2	68.4	71.2	67.2	69.6	65.5	68.6	66.2
New London, Conn.	74.9	73.2	73.8	69.8	68.5	72.3	74.6	80.1	72.5	76.7	71.4	74.0	73.5
Middle Atlantic States:													
New York City	69.4	63.8	67.6	62.0	61.3	67.4	72.1	75.3	69.5	72.8	70.8	71.6	69.5
Philadelphia, Pa.	71.9	68.2	67.2	59.8	58.9	67.2	67.9	72.0	68.5	71.5	68.7	72.1	69.6
Cape May, N. J.	73.7	78.1	77.7	69.4	76.4	83.4	82.6	85.5	74.4	80.1	72.2	74.2	77.5
Baltimore, Md.	65.3	63.2	70.4	58.3	58.3	64.0	62.8	70.5	65.8	67.1	67.1	64.0	68.2
Washington City	65.8	64.6	64.8	55.2	61.0	64.8	65.0	72.6	68.0	74.0	68.5	67.9	68.2
Lynchburg, Va.	65.8	69.5	59.0	62.6	64.1	72.9	77.0	77.1	75.1	76.8	73.1	71.0	71.0
South Atlantic States:													
Wilmington, N. C.	71.7	75.2	74.0	70.4	69.5	74.1	73.3	82.5	77.1	80.4	76.0	73.9	75.5
Charleston, S. C.	74.6	74.0	74.0	69.8	71.2	74.8	75.2	83.5	78.8	81.5	77.0	75.8	77.1
Augusta, Ga.	72.4	74.6	73.4	67.8	69.0	69.9	72.8	76.3	74.2	76.3	77.1	74.8	75.5
Savannah, Ga.	71.1	74.9	70.2	68.6	70.4	75.0	73.0	81.8	83.3	84.5	78.2	75.8	77.1
Florida Peninsula:													
Key West, Fla.	80.3	77.8	75.1	70.6	69.1	68.4	70.2	71.6	77.6	79.8	78.0	80.3	75.9
Eastern Gulf States:													
Mobile, Ala.	74.6	79.7	78.5	73.5	71.9	76.0	78.6	74.9	77.6	77.9	78.2	79.6	77.0
New Orleans, La.	73.0	74.0	75.0	73.0	73.0	75.0	74.0	79.0	77.0	78.0	75.0	76.5	76.1
Western Gulf States:													
Galveston, Tex.	76.6	80.0	81.8	79.0	69.6	73.1	71.9	71.8	75.2	81.0	77.9	81.9	75.5
Ohio Valley and Tennessee:													
Knoxville, Tenn.	71.9	69.6	62.3	59.8	70.0	76.6	74.6	68.1	78.7	74.2	75.0	70.1	71.1
Memphis, Tenn.	64.8	69.7	62.6	61.7	64.6	68.8	72.8	74.3	68.9	71.0	74.1	65.5	68.5
Nashville, Tenn.	63.4	68.8	58.6	60.1	59.7	66.5	68.8	66.7	67.9	64.9	73.8	65.7	68.5
Indianapolis, Ind.	79.9	74.9	68.4	60.1	64.6	68.4	69.2	72.4	70.9	67.6	74.9	74.3	73.8
Cincinnati, Ohio	78.9	74.3	70.0	60.6	59.0	59.2	64.5	70.5	73.8	71.7	73.6	71.8	68.5
Pittsburg, Pa.	61.5	57.3	59.3	57.6	63.2	64.2	67.2	69.1	66.6	58.8	65.2	68.2	63.5
Lower Lakes:													
Oswego, N. Y.	71.0	68.3	71.8	65.5	64.6	69.0	68.9	66.5	66.5	62.7	70.3	75.1	67.8
Rochester, N. Y.	76.4	70.4	71.3	63.0	61.0	64.5	65.8	66.3	68.1	61.6	72.4	73.6	67.9
Cleveland, Ohio	74.3	67.3	65.4	58.9	66.7	69.0	69.7	75.0	69.4	65.1	72.6	71.0	69.5
Toledo, Ohio	76.4	78.2	69.0	62.2	61.2	66.8	68.1	77.4	70.9	64.2	72.6	65.7	70.5
Detroit, Mich.	82.0	73.8	72.4	64.6	63.8	71.2	71.9	76.8	72.9	64.2	81.7	86.6	75.5
Upper Lakes:													
Escanaba, Mich.	77.0	77.1	74.0	73.4	78.7	77.0	77.2	78.4	80.2	81.0	67.8	65.9	75.5
Grand Haven, Mich.	78.8	75.2	75.7	63.4	67.3	71.8	71.8	74.4	74.3	67.4	79.1	81.6	75.5
Marquette, Mich.	84.0	81.7	81.8	69.6	60.8	64.0	66.7	61.3	59.0	65.0	74.3	78.5	75.5
Duluth, Minn.	78.2	61.4	59.6	63.8	69.4	67.8	69.8	66.2	65.4	66.2	75.2	71.4	68.5
Upper Mississippi Valley:													
Saint Paul, Minn.	66.3	68.6	67.8	68.8	64.9	71.0	72.4	72.8	69.5	68.5	72.7	71.0	68.5
Keokuk, Iowa	70.6	67.6	67.1	60.8	62.2	64.0	68.1	67.4	64.6	64.0	75.0	67.2	68.5
St. Louis, Mo.	70.0	69.7	56.8	56.2	65.2	69.3	74.0	75.4	75.0	70.0	69.7	65.5	68.5
Saint Louis, Mo.	69.4	66.8	61.4	56.4	64.4	66.6	74.0	68.3	63.9	59.2	71.5	65.3	67.5
Missouri Valley:													
Leavenworth, Kans.	73.5	72.3	67.1	61.9	66.4	56.4	63.4	52.1	43.1	35.4	42.2	64.5	68.5
Omaha, Nebr.	71.5	74.0	68.6	53.4	68.6	67.8	72.6	72.1	67.9	60.1	71.8	72.8	68.9
Northern Slope:													
Cheyenne, Wyo.	41.6	48.3	53.0	56.8	59.6	55.2	59.4	49.4	54.9	48.9	62.8	61.4	55.5
Middle Pacific Coast:													
San Francisco, Cal.	75.2	82.7	84.4	70.4	71.7	71.6	80.8	81.1	77.4	64.4	68.1	81.1	75.5

APPENDIX 36.

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year. (Computed from September, 1872, to and including October, 1879, except at stations opened subsequent to the former date.)

[The daily means are obtained by dividing the sum of the 7.35 a. m., 4.35 and 11 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
New England:	<i>P. et.</i>	<i>P. et.</i>	<i>P. et.</i>	<i>P. et.</i>	<i>P. et.</i>	<i>P. et.</i>	<i>P. et.</i>	<i>P. et.</i>	<i>P. et.</i>	<i>P. et.</i>	<i>P. et.</i>	<i>P. et.</i>	<i>P. et.</i>
Eastport, Me.....	79.4	77.7	77.6	78.4	78.9	78.3	79.5	79.7	80.1	77.2	77.1	78.1	77.7
Portland, Me.....	76.0	71.5	71.1	65.9	63.7	68.5	70.3	71.9	74.0	71.3	72.3	74.5	70.6
Mount Washington, N. H.....	87.1	85.2	86.5	87.9	84.0	84.2	87.0	85.3	85.6	89.0	88.1	84.3	86.5
Burlington, Vt.....	72.3	70.5	71.0	68.9	62.2	64.6	66.4	68.1	69.6	68.7	69.3	71.9	68.5
Boston, Mass.....	73.8	71.4	70.3	67.1	62.3	67.0	69.4	71.8	73.2	69.3	72.3	73.0	70.3
New Haven, Conn.....	75.2	73.4	71.6	65.2	63.8	70.3	70.7	74.0	74.8	71.7	72.5	74.0	71.2
New London, Conn.....	74.3	70.6	71.8	67.8	67.6	75.1	75.7	73.4	75.8	72.8	71.5	70.9	72.5
Middle Atlantic States:													
Albany, N. Y.....	80.4	78.6	78.3	69.3	65.4	70.4	71.3	71.5	75.0	77.1	82.1	80.3	75.6
New York City.....	70.2	70.6	65.5	64.7	62.9	68.1	69.6	69.3	72.1	67.9	68.3	69.9	68.0
Philadelphia, Pa.....	73.5	67.5	64.9	62.6	60.6	66.8	66.1	70.9	70.8	67.2	67.5	71.4	67.3
Atlantic City, N. J.....	82.3	77.6	78.6	76.5	77.5	82.2	83.1	83.0	81.1	78.4	77.7	80.6	79.9
Barneget City, N. J.....	81.3	78.3	78.4	75.6	74.6	78.3	80.9	79.3	78.5	77.1	78.6	80.0	78.4
Cape May, N. J.....	78.4	77.1	76.3	75.3	75.8	78.3	80.6	80.3	76.8	74.4	74.1	75.2	77.3
Sandy Hook, N. J.....	76.2	73.8	74.2	72.3	70.0	73.9	74.5	73.3	75.2	71.9	73.2	74.1	73.9
Baltimore, Md.....	71.5	67.9	65.1	61.5	60.7	64.5	64.5	70.5	71.6	68.0	67.1	68.7	67.3
Washington City.....	72.6	67.9	63.3	62.6	62.3	66.3	66.2	73.5	73.4	70.4	71.1	71.4	69.0
Cape Henry, Va.....	75.0	72.3	72.3	71.3	72.0	73.3	74.8	77.6	75.6	72.1	72.6	72.1	74.1
Lynchburg, Va.....	66.7	60.0	54.7	53.6	60.4	65.3	65.3	72.6	70.4	67.1	65.2	65.1	64.3
Norfolk, Va.....	73.4	70.5	65.4	63.7	63.3	70.2	69.3	73.2	77.1	73.9	74.1	71.2	71.7
South Atlantic States:													
Cape Hatteras, N. C.....	79.3	77.5	78.1	78.7	78.1	79.4	80.4	81.0	78.9	79.3	74.9	76.2	78.2
Charlotte, N. C.....	68.5	61.4	58.6	53.0	63.3	62.2	66.1	77.9	63.4	67.2	71.1	70.1	.....
Kitty Hawk, N. C.....	78.5	75.3	77.6	78.6	78.9	78.9	78.9	81.1	78.6	78.2	79.0	77.9	78.9
Smithville, N. C.....	78.6	74.6	75.8	74.9	76.7	76.3	77.4	78.4	77.5	78.7	78.6	76.7	75.9
Wilmington, N. C.....	71.0	67.0	67.2	63.3	70.3	73.2	73.2	78.5	77.2	74.0	72.0	72.1	72.3
Charleston, S. C.....	73.2	70.4	68.3	68.5	71.2	73.2	73.6	75.1	75.4	74.4	73.6	72.4	71.1
Augusta, Ga.....	74.0	67.9	63.2	62.9	64.3	68.3	69.1	73.9	72.5	71.0	72.7	74.3	70.4
Savannah, Ga.....	71.4	68.3	65.8	64.7	68.2	71.6	71.7	75.7	75.6	74.4	71.8	70.3	71.4
Jacksonville, Fla.....	73.7	70.3	65.8	65.0	67.5	71.3	71.2	73.8	77.9	73.4	73.5	72.7	71.2
Florida Peninsula:													
Key West, Fla.....	73.4	77.3	69.6	68.8	70.0	71.1	71.0	71.6	74.4	75.3	77.4	78.2	73.5
Punta Rasa, Fla.....	77.1	75.5	72.1	70.3	72.0	74.4	74.1	77.0	77.7	73.9	74.9	74.4	74.8
Eastern Gulf States:													
Atlanta, Ga.....	67.3	57.6	53.0	54.3	57.3	55.4	64.2	73.9	65.4	71.9	65.3	70.3	.....
Mobile, Ala.....	77.9	72.6	72.9	71.6	70.6	73.6	74.0	77.9	74.9	73.6	74.6	67.6	73.9
Montgomery, Ala.....	72.4	63.3	64.1	63.3	62.9	68.2	69.3	70.1	69.0	68.1	70.2	72.6	68.0
Vicksburg, Miss.....	70.9	64.3	64.4	65.4	66.6	70.1	72.4	72.9	71.4	69.6	68.5	69.6	69.0
New Orleans, La.....	71.0	63.9	69.7	63.0	63.8	71.4	72.3	72.7	71.2	69.2	71.1	72.0	70.3
Western Gulf States:													
Shreveport, La.....	74.7	68.0	66.3	66.4	68.2	69.6	70.6	70.3	70.8	71.2	70.7	74.1	70.3
Fort Gibson, Ind. T.....	69.5	65.5	59.3	60.5	67.7	71.1	69.0	67.1	68.5	64.1	63.6	67.9	67.2
Corralcane, Tex.....	72.2	63.9	60.9	64.3	71.4	70.5	67.3	63.1	64.4	63.2	67.0	66.9	67.0
Denison, Tex.....	71.2	63.4	59.6	63.4	72.2	72.6	69.5	68.1	66.8	59.3	65.1	65.5	66.7
Galveston, Tex.....	76.3	78.0	78.9	73.3	74.1	72.2	71.8	72.3	72.5	72.2	76.9	80.4	74.8
Indianola, Tex.....	81.3	74.9	79.0	73.9	76.9	75.5	73.7	75.1	75.9	74.3	78.9	81.4	77.9
San Antonio, Tex.....	69.9	62.3	62.0	60.5	67.9	69.4	60.1	65.2	64.8	65.1	68.0	68.2	68.2
Rio Grande Valley:													
Brownsville, Tex.....	73.6	74.6	75.1	70.9	71.9	68.9	68.3	70.4	75.4	72.4	74.0	76.1	72.0
Rio Grande City, Tex.....	69.3	64.9	65.7	61.6	62.1	64.0	58.0	67.2	67.8	70.4	66.3	65.5	.....
Ohio Valley and Tennessee:													
Knoxville, Tenn.....	74.1	63.1	62.3	59.7	62.5	71.4	71.9	74.9	72.1	68.1	71.3	74.7	69.3
Memphis, Tenn.....	71.3	65.7	60.4	59.7	63.4	68.1	70.3	70.3	69.6	67.6	64.9	68.3	67.0
Nashville, Tenn.....	72.1	67.5	61.8	59.4	59.6	65.6	66.7	68.6	68.7	66.2	68.7	71.8	64.6
Louisville, Ky.....	70.2	66.0	61.1	57.6	57.9	62.9	65.3	67.7	66.6	64.2	68.0	70.2	63.4
Indianapolis, Ind.....	72.2	68.3	67.1	57.6	58.2	66.7	68.8	69.7	68.8	64.9	70.0	73.7	67.5
Cincinnati, Ohio.....	70.3	63.4	63.9	57.4	56.3	63.4	65.1	67.8	65.6	62.5	67.0	70.7	65.4
Columbus, Ohio.....	65.0	66.7	64.5	54.0	54.3	60.1	64.6	69.4	70.4	69.0	69.4	73.9	.....

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Ohio Valley and Tennessee—													
Continued:	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Morgantown, W. Va.	72.6	68.2	64.2	62.1	61.4	67.6	71.8	73.2	74.3	71.9	72.9	73.0	69.4
Pittsburg, Pa.	73.4	73.5	70.6	64.8	60.2	65.8	69.6	70.4	72.5	71.7	72.8	78.4	70.4
Lower Lakes:													
Buffalo, N. Y.	79.0	78.0	75.7	71.7	65.4	69.5	71.5	69.5	70.6	71.0	75.9	80.4	73.3
Oswego, N. Y.	77.8	75.6	72.9	68.8	63.8	69.1	70.4	70.1	70.7	70.6	72.0	77.2	71.6
Rochester, N. Y.	81.4	78.2	76.3	67.5	59.7	65.1	66.6	66.8	69.6	70.9	76.8	81.0	71.9
Erie, Pa.	80.6	78.3	77.7	69.7	64.0	69.0	69.9	69.5	72.0	71.5	75.3	80.9	72.0
Cleveland, Ohio	77.7	74.8	70.7	68.1	62.7	67.8	71.0	66.7	70.1	69.3	74.3	78.5	71.8
Sandusky, Ohio	76.0	73.8	70.0	68.0	63.0	68.2	71.6	66.8	72.4	70.6	74.6	77.1	72.8
Toledo, Ohio	74.8	72.9	71.7	63.7	61.6	67.2	69.6	70.4	71.5	69.9	70.8	75.6	70.0
Detroit, Mich.	77.6	74.2	73.5	63.6	60.8	67.7	70.2	69.6	72.9	70.5	74.7	77.2	71.2
Upper Lakes:													
Alpena, Mich.	76.5	72.1	75.2	69.1	67.4	72.2	71.8	75.7	77.2	77.4	81.5	79.5	74.9
Escanaba, Mich.	75.3	71.5	70.8	68.9	68.4	72.2	71.4	74.2	76.8	76.6	78.0	78.6	73.9
Grand Haven, Mich.	77.1	74.7	74.9	66.6	65.1	71.1	71.7	73.6	74.6	72.5	74.4	76.8	73.2
Marquette, Mich.	75.2	73.0	72.1	67.5	63.6	67.8	66.8	68.4	70.4	70.2	74.3	76.3	70.7
Port Huron, Mich.	79.0	77.0	77.5	69.1	65.9	71.1	73.0	71.0	72.6	72.2	77.7	80.9	74.6
Chicago, Ill.	76.2	73.8	72.0	66.7	67.0	69.4	70.2	70.3	68.5	68.0	71.3	73.9	71.0
Milwaukee, Wis.	79.1	77.0	77.0	71.6	68.6	73.2	74.3	73.6	73.9	71.9	75.3	77.8	75.0
Duluth, Minn.	73.4	73.0	69.8	65.6	65.7	71.7	67.7	71.1	73.2	68.3	73.6	74.1	70.2
Upper Mississippi Valley:													
Saint Paul, Minn.	71.8	70.6	68.9	57.8	57.6	66.3	67.9	69.9	70.0	69.0	72.6	76.2	68.5
La Crosse, Wis.	72.7	71.5	68.5	59.4	60.3	68.8	70.1	66.9	71.9	67.6	73.4	74.4	68.8
Davenport, Iowa	77.9	74.7	71.8	62.1	62.9	69.0	67.7	67.2	69.0	65.5	71.6	77.1	70.3
Des Moines, Iowa	76.3	70.1	67.2	57.8	63.6	69.8	68.1	69.0	65.6	65.6	67.6	74.4	.....
Iubaque, Iowa.	70.4	69.6	68.7	60.8	60.4	67.7	65.1	67.0	69.9	67.1	73.0	72.1	68.0
Keokuk, Iowa.	75.6	72.1	69.0	63.6	64.6	70.2	68.8	67.8	68.6	66.0	70.0	75.4	69.9
Calro, Ill.	71.9	67.2	62.9	61.0	65.6	71.8	70.5	71.6	72.2	67.4	66.5	70.6	68.3
Saint Louis, Mo.	67.9	66.8	63.8	58.2	58.4	65.0	65.4	64.7	63.5	59.6	63.9	69.2	64.2
Missouri Valley:													
Leavenworth, Kans.	73.6	69.9	64.5	60.7	64.6	67.7	68.2	64.0	64.1	62.6	64.9	71.1	66.8
Omaha, Nebr.	74.6	72.9	67.6	60.7	63.7	68.8	71.2	64.2	69.5	63.6	71.0	72.7	69.4
Yankton, Dak.	67.6	69.0	69.4	65.0	67.2	71.1	71.4	70.6	66.7	61.4	66.6	69.9	67.8
Extreme Northwest:													
Breckenridge, Minn.	77.0	77.7	77.9	72.1	66.2	72.7	72.4	75.8	73.5	68.5	76.8	79.3	74.5
Bismarck, Dak.	69.8	72.1	70.0	62.2	62.9	68.3	60.0	59.2	58.2	61.2	69.2	70.1	64.0
Pembina, Dak.	83.5	84.9	82.1	72.7	67.8	72.1	71.3	74.8	73.9	74.7	82.8	85.1	76.2
Northern Slope:													
Cheyenne, Wyo.	58.8	54.5	55.4	56.0	53.5	44.3	46.6	46.3	44.9	44.9	53.2	57.4	52.2
North Platte, Nebr.	69.7	63.1	63.5	58.8	63.8	58.9	63.8	61.8	59.9	58.4	64.2	67.8	63.5
Middle Slope:													
Denver, Colo.	52.0	51.5	46.4	48.7	45.2	40.2	44.5	45.2	43.9	40.9	47.1	53.4	46.5
Pike's Peak, Colo.	64.0	65.2	71.6	73.6	67.6	61.8	61.7	62.0	63.2	62.1	64.3	64.2	68.6
Dodge City, Kans.	71.7	69.8	68.3	58.0	63.2	60.9	62.1	63.2	57.8	57.8	62.4	67.8	63.6
Southern Slope:													
Sill, Fort. Ind. T.	65.4	63.4	52.0	55.5	62.4	65.3	62.3	62.1	60.9	58.8	65.2	71.4	62.8
Concho, Fort. Tex.	59.4	52.1	51.8	54.0	58.2	55.0	51.2	53.8	58.5	54.6	58.2	49.8	54.8
Davis, Fort. Tex.	47.1	45.1	42.7	28.5	36.5	51.4	50.6	54.5	47.3	47.8	42.2	51.9	.....
Stockton, Fort. Tex.	50.3	45.7	40.5	33.6	43.7	46.0	34.8	33.1	43.0	43.8	58.6	61.9	41.8
Southern Plateau:													
La Mesilla, N. Mex.	56.0	47.0	38.2	36.7	27.0	30.5	49.0	49.0	41.3	45.5	48.6	56.6	45.4
Santa Fe, N. Mex.	52.2	51.1	38.6	35.0	29.9	30.7	44.3	49.1	42.9	39.4	45.5	50.3	43.4
El Paso, Tex.	52.7	56.9	47.6	44.0	40.9	43.8	46.4	51.5	57.4	58.7	58.6	61.3	.....
Apache, Fort. Ariz.	62.3	51.3	35.8	30.1	23.2	25.3	52.2	57.4	39.6	40.6	56.2	50.3	.....
Florence, Ariz.	50.5	48.0	41.7	40.1	29.0	24.2	35.5	35.2	35.8	38.5	38.4	48.4	41.9
Grant, Fort. Ariz.	51.7	44.2	27.7	30.0	23.6	25.4	44.0	49.6	33.9	29.2	40.3	40.6	.....
Prescott, Ariz.	51.1	48.6	40.8	41.2	24.2	24.0	34.5	41.8	38.6	35.3	43.0	47.5	42.8
Tucson, Ariz.	36.8	45.2	41.2	36.0	30.4	26.8	38.6	43.0	41.7	43.7	34.2	39.0	41.5
Yuma, Ariz.	40.4	40.3	37.9	37.1	26.6	28.4	34.0	34.7	35.7	34.7	35.6	42.6	35.3
Middle Plateau:													
Floche, Nev.	64.4	58.6	41.0	43.2	26.6	27.0	16.6	24.7	20.2	30.9	41.0	52.6	41.9
Winnemucca, Nev.	62.9	61.0	50.0	48.4	38.6	35.8	21.2	20.8	25.6	40.4	58.5	67.4	44.6
Salt Lake City, Utah	66.7	60.4	49.8	42.5	40.0	32.2	29.8	29.0	30.2	39.5	57.9	67.9	46.7
Northern Plateau:													
Boise City, Idaho	69.8	67.0	61.2	53.0	52.6	47.6	37.2	37.3	45.8	58.8	64.6	68.4	55.9
Umatilla, Oreg.	80.0	75.8	64.4	53.8	53.4	45.1	44.2	38.6	45.7	62.1	76.6	82.4	58.6
North Pacific Coast:													
Olympia, Wash.	85.4	85.6	84.8	75.5	71.3	69.2	69.1	73.1	80.4	85.1	85.5	86.7	78.3
Portland, Oreg.	75.8	78.7	76.6	68.0	65.9	63.3	63.9	66.6	67.5	75.2	76.6	76.7	70.8
Roseburg, Oreg.	82.8	78.6	79.8	73.5	73.3	63.4	66.2	63.2	67.0	78.7	87.3	90.5	74.8

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Middle Pacific Coast:	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Red Bluff, Cal.	72.6	73.0	71.8	59.8	50.8	33.2	33.0	33.0	34.7	43.3	66.8	62.0	53.2
Sacramento, Cal.	74.8	76.8	75.0	66.9	61.3	52.9	51.7	50.7	50.5	53.5	67.2	68.5	62.2
San Francisco, Cal.	71.8	72.3	70.5	69.4	71.3	71.9	77.7	79.0	77.2	71.9	72.2	71.5	72.9
South Pacific Coast:													
Campo, Cal.	63.8	67.0	68.8	67.7	65.8	58.9	55.8	52.1	48.2	54.0	50.6	56.1	61.9
Los Angeles, Cal.	62.8	71.9	72.4	68.2	67.0	69.0	68.1	67.4	69.0	60.2	51.9	52.8	66.0
San Diego, Cal.	73.2	76.2	75.4	71.6	73.6	75.3	76.8	77.3	76.9	72.5	69.3	68.3	73.6
Visalia, Cal.	73.0	72.5	67.1	62.2	49.6	42.6	41.0	41.9	47.0	59.3	76.2	66.4	61.2
Alaska Stations:													
Saint Michael's, Fort, Alaska.	95.8	97.4	97.8	93.8	91.4	82.7	80.4	85.4	85.7	83.4	80.7	84.3	86.8

APPENDIX 37.

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year. (Computed from November, 1879, to December, 1884, both inclusive, except at stations opened subsequent to the former date.)

[The daily means are obtained by dividing the sum of the 7 a. m., 3 and 11 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
New England:	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Eastport, Me.	73.8	74.8	72.5	70.3	74.5	74.0	78.5	78.5	78.2	75.0	73.4	76.8	74.9
Portland, Me.	71.1	69.2	65.4	60.0	64.5	68.5	69.6	70.9	72.9	69.6	69.2	72.4	68.4
Mount Washington, N. H.	82.1	85.2	88.4	86.5	86.6	81.6	88.1	86.6	85.6	86.6	87.7	84.8	85.7
Boston, Mass.	71.9	72.7	71.0	66.4	70.6	69.7	71.9	72.8	74.1	71.1	70.2	72.3	71.3
Block Island, R. I.	75.1	77.1	74.4	75.2	82.2	82.8	82.2	82.2	82.6	77.8	76.1	78.7	78.9
New Haven, Conn.	73.3	73.1	68.1	64.7	70.1	71.2	73.4	75.1	76.0	73.7	71.0	75.0	72.1
New London, Conn.	72.7	74.9	71.3	68.6	72.7	75.1	77.0	78.1	78.9	76.8	72.0	75.1	74.5
Middle Atlantic States:													
Albany, N. Y.	69.2	68.3	65.6	56.1	58.8	60.8	63.0	63.9	67.9	65.5	67.1	71.8	64.6
New York City.	77.4	77.3	71.8	66.4	70.3	70.6	71.9	72.3	74.1	72.0	71.0	76.8	72.8
Philadelphia, Pa.	70.4	72.7	69.5	68.2	74.0	72.8	70.8	73.6	72.7	72.3	69.7	74.9	72.3
Atlantic City, N. J.	77.8	78.8	76.0	76.1	80.3	81.0	80.3	81.7	81.8	77.7	76.7	79.0	78.8
Barnegat City, N. J.	80.9	80.2	74.1	74.1	79.3	79.4	79.4	81.7	81.7	79.7	76.4	80.4	78.8
Cape May, N. J.	79.1	77.2	73.9	74.4	77.9	78.2	77.5	79.5	77.9	75.5	71.6	77.2	76.8
Sandy Hook, N. J.	74.4	78.0	74.8	72.2	73.8	73.4	72.6	74.7	75.1	71.9	71.3	75.8	74.6
Delaware Breakwater, Del.	83.7	79.9	78.7	76.5	78.6	80.3	79.5	79.8	80.8	78.0	76.6	79.1	80.0
Baltimore, Md.	71.0	67.0	63.8	59.7	61.9	65.0	64.6	72.0	69.3	69.1	65.0	68.4	66.1
Washington City.	78.5	72.3	68.5	65.4	66.1	69.0	69.4	68.1	73.4	73.2	70.7	75.2	71.3
Cape Henry, Va.	79.5	75.1	71.7	70.8	71.6	74.1	75.3	77.7	76.6	74.2	69.6	73.8	74.3
Chincoteague, Va.	83.7	80.2	76.0	77.1	81.8	83.0	82.2	83.9	81.8	80.6	77.8	80.1	80.8
Lynchburg, Va.	68.6	63.8	58.8	58.8	60.5	60.0	62.8	65.6	67.8	67.8	64.2	67.6	64.2
Norfolk, Va.	77.6	71.2	67.3	66.8	67.1	69.3	71.5	75.6	75.7	75.6	70.6	73.2	71.8
South Atlantic States:													
Charlotte, N. C.	74.4	67.0	68.6	63.3	61.6	63.5	62.9	67.1	70.7	69.0	67.0	71.2	66.7
Hatteras, N. C.	85.8	81.8	77.0	79.9	80.4	82.9	80.8	81.7	81.4	82.2	79.6	81.1	81.4
Kitty Hawk, N. C.	82.4	77.7	73.4	75.6	77.4	77.9	77.5	80.8	79.6	78.1	74.8	78.1	77.8
Macon, Port. N. C.	83.6	81.4	75.8	80.6	79.9	83.2	81.3	82.7	82.8	82.8	79.4	80.8	81.1
Smithville, N. C.	83.9	80.1	75.5	80.7	77.1	77.4	77.8	80.3	81.0	79.2	77.0	80.2	79.0
Wilmington, N. C.	74.9	71.0	67.1	68.7	71.4	73.7	75.9	78.4	75.6	75.3	71.4	73.6	73.1
Charleston, S. C.	79.2	74.0	71.0	73.8	73.4	78.8	75.4	77.9	79.5	79.1	75.1	77.7	75.9
Augusta, Ga.	73.9	67.5	64.4	65.8	62.9	68.5	67.3	71.4	71.5	71.2	69.6	71.4	68.9
Savannah, Ga.	73.0	67.8	62.0	66.8	68.4	70.0	69.8	75.8	76.7	76.2	70.4	71.0	70.6
Jacksonville, Fla.	76.6	71.8	65.5	68.5	70.5	71.7	73.2	75.7	77.4	77.1	76.5	76.0	73.4
Florida Peninsula:													
Cedar Key, Fla.	81.4	76.2	73.1	73.6	70.7	74.2	73.6	75.3	75.1	75.9	77.9	81.2	75.7
Key West, Fla.	79.6	75.1	70.7	69.4	71.8	71.7	69.4	72.8	75.7	77.7	73.9	79.3	74.8
Sanford, Fla.	78.2	75.0	72.9	72.0	70.8	78.6	75.0	78.9	80.9	80.0	79.4	77.8	76.9
Eastern Gulf States:													
Atlanta, Ga.	73.7	65.1	62.8	63.0	63.4	68.0	66.4	73.0	70.5	70.1	65.2	69.9	67.4
Pensacola, Fla.	78.4	77.2	73.8	77.2	74.7	77.7	78.1	78.7	76.9	76.1	73.8	78.2	76.5
Mobile, Ala.	78.9	74.8	70.8	73.0	72.0	74.4	75.9	76.2	74.8	75.6	77.4	79.3	74.4
Montgomery, Ala.	74.7	68.0	65.8	67.7	65.8	70.1	68.9	72.5	69.4	68.7	70.8	74.4	69.7
Vicksburg, Miss.	72.8	68.5	63.5	66.6	69.7	72.1	73.3	70.8	72.9	75.1	71.6	72.4	70.7
New Orleans, La.	73.4	71.1	68.9	71.6	71.4	74.2	72.2	71.9	72.7	74.3	70.8	73.1	71.9
Western Gulf States:													
Shreveport, La.	74.6	73.7	66.6	67.6	72.8	70.5	69.9	69.4	70.9	75.0	74.0	72.1	71.5
Fort Smith, Ark.	71.8	72.6	61.6	64.4	68.1	73.8	73.3	72.9	71.5	76.8	69.6	72.2	70.8
Little Rock, Ark.	75.0	73.1	65.4	68.3	75.3	76.1	76.4	74.8	76.6	79.1	74.2	73.4	74.0
Galveston, Tex.	82.5	80.6	78.3	77.9	76.4	74.1	73.8	73.3	74.1	75.9	77.3	79.6	77.0
Indianola, Tex.	82.0	80.6	80.1	79.4	79.2	77.1	78.3	77.5	78.6	78.9	77.8	81.6	79.4
Palestine, Tex.	68.6	70.4	65.1	71.4	75.4	74.6	74.0	69.8	69.8	74.8	70.2	68.2	70.8
Rio Grande Valley:													
Brownsville, Tex.	82.0	81.1	80.6	77.8	78.3	77.1	77.1	76.8	79.0	81.2	80.4	82.9	79.8
Rio Grande City, Tex.	72.0	65.4	71.9	68.7	70.5	68.6	60.4	67.0	67.2	73.1	65.4	69.2	68.0
Ohio Valley and Tennessee:													
Chattanooga, Tenn.	74.7	67.7	63.7	64.5	68.3	72.9	71.3	75.9	76.5	75.9	70.4	72.2	71.1
Knoxville, Tenn.	79.4	70.2	66.4	63.5	66.1	72.6	73.7	74.6	72.0	75.5	71.1	76.2	71.9
Memphis, Tenn.	76.5	72.1	63.7	64.0	67.3	77.1	69.4	70.4	71.6	76.2	72.0	74.0	70.8

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Ohio Valley and Tennessee—													
Continued:	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
Nashville, Tenn.	77.6	71.5	68.1	67.0	65.8	70.0	70.1	69.7	71.7	73.6	71.5	75.7	71.1
Louisville, Ky.	74.1	68.2	63.6	60.6	66.7	71.4	67.3	67.5	70.4	74.0	67.1	71.4	68.0
Indianapolis, Ind.	73.0	71.3	65.6	61.5	61.7	67.8	65.3	64.4	66.5	71.9	70.2	74.4	68.0
Cincinnati, Ohio	74.6	70.7	64.7	62.5	62.9	67.6	62.8	63.2	63.5	70.8	70.4	74.2	67.7
Columbus, Ohio	74.4	71.1	65.7	62.7	63.1	66.4	62.4	64.2	67.5	71.3	69.6	74.6	67.7
Pittsburg, Pa.	78.2	73.4	68.8	62.5	63.6	68.3	68.1	68.8	68.6	71.6	70.9	77.7	70.0
Lower Lakes:													
Buffalo, N. Y.	80.6	78.6	75.9	71.7	71.2	73.0	72.6	70.2	73.5	74.1	75.2	78.2	74.7
Oswego, N. Y.	70.5	72.5	73.4	68.0	70.4	72.5	72.3	71.4	72.0	70.9	69.9	73.0	71.3
Rochester, N. Y.	79.6	73.8	76.7	67.6	67.6	67.9	68.5	68.4	69.8	73.3	75.5	80.6	72.6
Erie, Pa.	78.8	76.8	75.3	69.8	67.6	70.3	70.2	69.9	71.7	73.0	73.8	78.2	73.0
Cleveland, Ohio	80.0	77.0	75.0	67.1	66.0	69.0	68.4	69.4	69.2	69.5	72.8	80.0	71.9
Sandusky, Ohio	76.1	74.0	73.0	67.6	67.8	69.4	67.4	69.3	70.4	72.4	71.7	76.0	71.1
Toledo, Ohio	76.2	73.4	68.5	64.6	64.9	69.2	66.5	70.1	70.6	71.9	71.6	75.8	70.1
Detroit, Mich.	77.4	76.8	73.3	64.0	65.3	68.9	67.9	70.4	71.5	71.2	71.6	77.2	71.1
Upper Lakes:													
Alpena, Mich.	76.5	76.6	76.1	69.1	70.6	74.0	73.5	76.0	77.1	76.1	80.7	79.9	75.5
Escanaba, Mich.	78.4	73.3	72.0	67.8	67.6	72.4	72.5	77.2	77.5	76.0	76.8	78.3	74.1
Grand Haven, Mich.	80.4	80.5	77.1	68.0	68.5	73.5	75.1	77.2	75.9	76.4	77.1	80.9	75.8
Mackinaw City, Mich.	74.3	73.6	69.9	69.0	70.8	75.5	74.1	75.0	77.2	73.2	77.5	80.2	74.2
Marquette, Mich.	68.1	68.0	67.6	64.4	62.7	68.0	67.6	73.1	72.6	70.2	72.9	72.7	68.8
Port Huron, Mich.	81.9	80.8	78.6	73.2	70.2	74.3	74.9	74.9	75.5	77.5	81.3	83.4	77.3
Chicago, Ill.	73.1	70.0	68.9	66.7	67.7	73.4	73.3	69.9	69.2	72.5	71.4	74.8	70.6
Milwaukee, Wis.	79.3	73.1	75.6	69.2	68.6	74.6	73.5	76.1	75.6	74.1	75.1	79.6	75.6
Duluth, Minn.	77.2	73.8	71.6	69.9	71.2	74.7	69.1	76.8	74.9	73.7	77.9	78.0	74.2
Upper Mississippi Valley:													
Saint Paul, Minn.	77.1	71.5	68.9	62.2	64.3	71.2	72.7	74.5	73.1	70.7	71.0	72.7	70.9
La Crosse, Wis.	72.0	70.0	69.4	63.1	57.9	65.9	67.9	70.1	71.7	68.6	70.2	72.1	68.3
Davenport, Iowa	65.8	66.7	64.7	63.2	63.8	72.6	69.7	68.4	69.0	70.7	67.0	68.8	67.5
Des Moines, Iowa	68.5	68.3	67.3	63.3	66.6	78.4	72.0	70.8	70.5	71.6	69.1	71.4	69.5
Dubuque, Iowa	66.1	68.5	65.5	59.1	61.5	70.0	68.4	69.5	70.6	70.5	67.8	68.5	66.9
Keokuk, Iowa	74.9	71.5	69.1	64.5	66.2	72.5	68.6	66.9	67.5	72.6	70.7	75.4	70.4
Calro, Ill.	77.5	73.2	67.1	64.8	69.6	74.3	72.0	72.0	74.1	76.2	71.6	74.9	72.2
Springfield, Ill.	71.3	68.9	64.8	61.7	65.5	71.6	66.8	65.2	66.0	71.0	67.0	70.8	67.7
Saint Louis, Mo.	76.9	73.2	72.4	67.7	73.0	75.2	69.9	69.6	68.1	76.0	72.6	76.7	72.0
Missouri Valley:													
Leavenworth, Kans.	70.7	67.6	63.6	59.9	64.2	68.3	66.7	66.5	65.2	69.8	67.6	71.1	66.8
Omaha, Nebr.	71.1	69.7	67.1	62.2	65.9	69.7	68.8	70.1	69.3	69.9	67.7	72.0	69.7
Bennett, Fort, Dak.	71.5	72.4	72.6	68.0	67.8	70.5	68.5	63.4	62.2	65.3	70.9	74.1	69.2
Huron, Dak.	64.2	67.0	70.4	70.3	71.2	73.3	76.4	75.3	71.5	69.9	70.2	66.4	70.1
Yankton, Dak.	66.2	68.1	66.9	65.3	65.6	70.8	70.6	69.4	67.8	69.3	69.7	69.5	68.3
Extreme Northwest:													
Moorhead, Minn.	63.7	81.2	80.3	73.1	66.7	69.2	71.6	72.8	72.7	74.8	79.4	81.8	75.6
Saint Vincent, Minn.	92.8	85.3	85.1	77.5	69.2	73.5	77.5	80.2	77.8	78.8	82.5	84.9	80.6
Bismarck, Dak.	63.5	82.2	78.9	71.3	61.9	70.1	67.0	65.7	67.4	70.5	77.8	79.9	72.8
Buford, Fort, Dak.	75.4	75.2	77.9	70.4	62.7	66.9	66.8	62.4	64.4	68.4	75.4	75.9	70.3
Northern Slope:													
Asatuboline, Fort, Mont.	65.0	67.0	66.7	59.0	54.8	55.8	52.4	51.7	57.5	63.0	64.5	62.8	60.0
Benton, Fort, Mont.	60.7	73.3	65.9	63.6	64.0	59.8	49.3	44.9	57.4	61.8	60.5	62.1	61.4
Custer, Fort, Mont.	78.2	73.0	68.4	61.2	66.0	65.0	51.3	44.4	53.1	60.9	63.9	69.1	61.4
Helena, Mont.	74.2	71.6	68.0	61.9	55.9	57.3	51.8	45.5	54.3	63.4	63.8	63.6	62.4
Maginnis, Fort, Mont.	53.8	48.0	47.2	49.8	53.2	49.0	47.4	47.2	53.9	60.4	55.5	52.4	51.1
Shaw, Fort, Mont.	71.8	69.0	62.0	58.9	55.7	57.8	52.2	51.9	58.7	63.7	62.1	63.1	60.6
Deadwood, Dak.	69.2	68.3	69.0	70.2	66.7	65.9	64.2	60.0	60.3	61.9	66.4	67.8	66.0
Cheyenne, Wyo.	61.3	62.4	43.9	52.8	53.5	51.2	47.2	51.4	41.5	50.6	48.9	54.0	50.7
North Platte, Nebr.	69.1	66.1	64.4	60.6	65.3	68.4	67.4	64.9	62.9	66.6	62.3	70.6	65.9
Middle Slope:													
Denver, Colo.	53.6	55.8	49.5	50.0	53.5	47.9	47.3	49.4	43.6	51.5	53.3	58.4	51.2
Pike's Peak, Colo.	71.3	72.5	74.2	77.7	77.0	68.9	69.2	73.4	71.9	75.8	68.1	74.9	73.3
West Las Animas, Colo.	65.8	63.3	47.7	47.6	54.9	55.6	49.5	53.6	47.5	55.8	57.8	66.7	57.1
Dodge City, Kans.	63.4	61.9	55.7	50.3	65.1	63.3	63.8	63.4	50.9	69.0	61.7	65.7	62.6
Elliot, Fort, Tex.	47.3	62.5	45.5	45.5	55.2	62.4	62.9	54.8	54.1	63.5	53.2	51.8	52.7
Southern Slope:													
Sill, Fort, Ind. T.	66.0	65.1	63.2	54.1	67.8	65.1	63.4	61.3	64.9	71.5	67.3	68.2	64.9
Concho, Fort, Tex.	69.8	68.0	60.6	58.1	63.7	60.1	61.1	62.8	70.5	75.8	69.7	69.7	68.3
Davis, Fort, Tex.	58.2	50.3	47.0	43.8	49.9	47.2	55.6	59.5	60.0	58.9	58.6	55.8	55.5
Stockton, Fort, Tex.	57.3	54.9	53.9	49.8	62.6	59.0	62.9	66.0	71.7	71.5	60.9	58.1	61.0
Southern Plateau:													
Santa Fe, N. Mex.	56.8	53.4	45.0	36.8	32.6	28.9	46.7	55.3	47.2	48.6	55.7	56.0	44.7
El Paso, Tex.	52.0	49.5	37.7	31.5	32.4	34.2	45.9	53.7	54.2	55.8	56.0	55.6	48.9
Apache, Fort, Ariz.	61.0	62.1	60.4	48.9	42.1	37.5	57.0	67.1	57.4	56.4	55.0	60.2	55.7
Grant, Fort, Ariz.	49.0	48.8	42.9	29.1	23.7	25.0	47.1	57.6	44.6	42.3	41.6	50.3	42.7
Prescott, Ariz.	56.4	58.9	53.3	44.0	36.2	31.0	52.8	59.5	48.6	44.7	50.7	61.0	50.2
Thomas, Camp, Ariz.	65.4	63.5	60.5	39.9	35.5	34.2	47.1	55.9	50.1	49.8	56.2	60.0	52.1
Yuma, Ariz.	45.4	45.0	44.9	41.9	38.1	40.0	43.8	48.2	44.3	46.3	48.6	50.9	43.4

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Middle Plateau:	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Winnemucca, Nev.	62.4	63.2	54.0	51.5	41.0	31.6	24.4	20.6	30.6	48.7	57.1	66.5	48.6
Salt Lake City, Utah.	52.1	54.1	48.4	50.7	41.2	33.0	30.5	34.0	35.6	46.6	48.6	53.4	44.0
Northern Plateau:													
Boise City, Idaho.	78.2	78.7	67.3	64.0	56.6	49.6	44.2	43.3	51.8	64.9	70.6	79.0	61.4
Lewiston, Idaho.	68.5	67.8	62.8	62.4	59.6	60.2	44.4	43.1	53.4	67.9	74.4	75.9	61.7
Dayton, Wash.	81.0	76.4	70.0	65.6	61.3	59.1	52.5	50.6	58.0	69.5	80.5	81.8	67.3
Spokane Falls, Wash.	81.6	80.8	75.4	68.5	58.4	58.7	51.1	50.4	62.0	75.4	79.4	78.3	68.4
North Pacific Coast:													
Canby, Fort, Wash.	81.8	78.7	83.2	85.1	81.3	86.9	83.9	82.9	86.7	87.6	88.6	86.8	84.5
Olympia, Wash.	84.6	83.3	80.9	79.0	72.7	70.6	67.6	71.0	78.9	83.2	85.9	83.4	78.5
Takoset Island, Wash.	84.7	81.4	81.6	83.0	83.5	87.1	89.2	92.2	89.3	88.8	90.2	83.1	85.6
Portland, Oreg.	81.3	79.4	74.5	70.5	63.5	63.5	64.9	67.9	73.8	82.4	80.5	81.4	74.0
Roseburg, Oreg.	83.2	80.3	73.6	71.4	64.0	64.9	60.0	61.9	66.2	79.0	84.6	84.5	72.3
Middle Pacific Coast:													
Cape Mendocino, Cal.	79.7	77.6	82.0	84.6	85.3	83.7	88.7	87.6	79.1	82.3	79.6	79.4	82.4
Red Bluff, Cal.	71.5	68.6	59.0	63.6	52.4	42.2	34.0	35.3	45.3	55.3	62.1	77.6	55.8
Sacramento, Cal.	78.9	74.7	68.4	70.7	64.1	61.6	56.8	56.3	57.9	66.6	69.4	83.1	67.4
San Francisco, Cal.	75.6	73.5	73.6	77.0	73.8	78.0	79.5	82.0	78.7	77.0	72.1	79.9	76.8
South Pacific Coast:													
Los Angeles, Cal.	62.7	65.0	72.5	72.7	71.3	70.4	70.8	70.6	68.9	67.9	61.4	67.1	68.2
San Diego, Cal.	66.6	68.5	74.3	74.0	73.3	74.5	75.6	76.5	75.3	71.2	64.6	69.6	71.9
Alaska Stations:													
Saint Michael's, Ft., Alaska	97.5	97.7	96.4	95.4	92.9	85.1	83.2	86.7	87.9	89.5	93.0	94.0	91.4
Sitka, Alaska.	75.2	74.5	71.3	63.6	74.9	77.0	79.5	79.6	81.4	75.2	77.6	75.8	75.3
Unalakha, Alaska.	86.2	85.9	82.8	80.3	77.7	78.0	77.8	81.3	77.8	79.0	80.0	81.4	79.5
Behring's Island, Behring Sea	83.3	84.3	87.4	90.1	88.5	87.6	91.6	92.6	85.2	85.2	88.0	86.4	87.7

APPENDIX 38.

Mean relative humidity at stations of the Signal Service, United States Army, for each month and the year, computed from the 7 a. m., 3 and 11 p. m. (Washington time) observations, and from January 1, 1882, to December 31, 1884.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
New England:	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Eastport, Me.	74.8	75.6	72.7	73.5	73.3	73.4	79.8	76.8	76.3	74.7	74.6	77.1	75.1
Portland, Me.	71.7	69.3	63.2	61.9	63.2	66.2	69.6	71.0	71.9	70.3	68.8	73.7	68.4
Mount Washington, N. H.	83.8	87.2	89.2	89.6	89.8	83.5	92.4	89.5	87.7	88.0	87.0	88.2	87.8
Boston, Mass.	73.2	74.7	69.9	72.0	72.2	70.4	71.1	72.4	74.3	73.4	70.8	73.8	72.4
Block Island, R. I.	76.4	77.8	73.7	78.6	82.1	83.3	82.1	82.1	82.3	78.9	77.1	80.1	79.5
New Haven, Conn.	73.5	74.1	67.6	67.1	69.0	70.9	72.9	74.1	75.3	74.4	70.9	75.9	72.1
New London, Conn.	73.0	76.7	71.7	70.2	70.9	74.9	75.9	77.4	78.6	79.2	72.7	74.4	74.7
Middle Atlantic States:													
Albany, N. Y.	65.2	65.7	63.0	56.9	57.5	60.5	63.8	62.7	67.4	65.3	63.6	69.1	63.4
New York City	78.0	78.2	71.2	68.1	69.3	70.8	71.5	71.1	73.5	72.6	71.7	76.3	72.7
Philadelphia, Pa.	76.6	73.2	69.0	78.9	78.9	75.4	73.5	76.8	74.9	76.0	69.2	73.7	74.1
Atlantic City, N. J.	75.7	78.9	76.1	77.6	78.4	81.1	79.1	80.7	80.1	79.6	76.5	77.7	78.5
Barnegat City, N. J.	80.3	82.0	73.8	74.4	78.1	79.7	79.3	81.1	81.7	81.2	77.0	76.6	78.9
Cape May, N. J.	78.8	77.4	76.0	77.1	77.2	79.6	80.5	79.9	78.5	76.9	73.2	77.9	77.8
Sandy Hook, N. J.	77.8	79.7	74.9	74.2	72.9	73.8	71.9	74.0	74.9	73.8	73.0	76.9	74.7
Delaware Breakwater, Del.	84.6	82.2	79.3	78.5	78.5	81.5	79.8	78.9	80.5	79.7	77.1	79.2	79.1
Baltimore, Md.	70.7	67.3	63.0	61.5	62.3	64.8	65.8	69.3	69.6	70.3	64.1	67.2	66.3
Washington City	80.1	74.9	69.4	68.1	67.3	68.7	69.4	72.7	73.8	74.4	70.9	75.4	72.1
Cape Henry, Va.	81.3	77.3	72.9	74.7	72.8	76.4	76.8	78.9	78.2	77.9	70.9	75.0	76.1
Chincoteague, Va.	83.8	80.0	76.3	77.4	79.2	83.6	82.2	83.4	81.4	81.4	76.8	78.8	80.4
Lynchburg, Va.	67.2	63.2	57.9	63.4	62.1	68.0	63.7	67.4	68.9	70.0	62.2	60.2	63.0
Norfolk, Va.	75.6	71.4	66.8	69.8	69.4	71.6	74.1	76.6	77.4	78.7	70.6	72.2	72.9
South Atlantic States:													
Charlotte, N. C.	76.7	71.8	63.9	64.7	62.6	67.1	64.1	68.1	72.0	71.5	64.9	70.1	68.1
Hatteras, N. C.	85.6	81.1	77.8	80.0	80.1	82.9	81.4	82.9	82.1	84.3	79.6	82.9	81.7
Kitty Hawk, N. C.	81.5	77.7	73.5	78.1	78.1	79.6	78.4	81.0	80.2	80.6	74.7	76.7	78.4
Mason, Fort, N. C.	83.5	82.2	76.6	81.4	79.7	83.2	81.1	83.0	83.4	83.7	79.0	79.9	81.4
Smithville, N. C.	83.0	81.2	76.3	79.7	76.8	79.0	77.9	81.2	82.1	80.2	74.6	78.7	79.2
Wilmington, N. C.	75.0	71.8	67.6	70.5	70.8	75.1	77.1	78.4	79.7	77.0	69.3	72.4	73.6
Charleston, S. C.	79.9	78.9	74.5	76.5	73.8	77.5	77.8	79.6	82.1	80.8	75.0	80.0	78.9
Augusta, Ga.	71.9	68.5	63.4	66.5	65.3	72.6	69.2	71.1	72.0	70.2	67.0	71.2	69.1
Savannah, Ga.	71.1	68.9	61.9	67.2	66.2	72.6	70.4	74.8	76.1	75.3	66.9	69.9	70.1
Jacksonville, Fla.	77.1	74.1	68.1	72.1	69.6	75.2	74.7	77.1	78.7	78.5	72.2	79.8	75.2
Florida Peninsula:													
Cedar Keys, Fla.	81.1	75.1	74.5	73.5	69.7	75.4	74.6	75.5	74.1	76.7	76.6	81.8	75.7
Key West, Fla.	79.6	75.9	71.7	70.2	69.6	71.7	70.1	72.1	75.9	79.0	80.5	82.0	74.9
Eastern Gulf States:													
Atlanta, Ga.	75.6	69.5	64.2	64.0	62.6	71.7	68.4	73.6	68.1	70.3	62.4	69.7	69.3
Pensacola, Fla.	77.3	79.0	75.8	76.4	74.3	79.7	79.3	79.2	78.0	74.8	69.0	77.2	76.5
Mobile, Ala.	78.5	75.5	72.7	72.5	70.9	74.7	76.4	75.4	73.2	74.1	76.9	78.7	73.9
Montgomery, Ala.	74.2	69.3	65.8	67.3	63.7	72.4	71.4	73.4	67.1	66.7	69.4	73.9	69.6
Vicksburg, Miss.	73.4	68.8	62.7	67.8	69.8	73.2	74.4	73.2	71.6	74.0	69.9	70.8	70.8
New Orleans, La.	78.4	71.9	60.4	71.3	70.4	78.0	71.7	71.8	70.9	73.8	68.2	72.3	71.6
Western Gulf States:													
Shreveport, La.	75.3	74.1	65.7	69.6	72.1	71.4	69.0	70.8	68.3	74.1	74.2	71.3	71.4
Little Rock, Ark.	78.7	75.1	65.1	70.1	74.3	76.9	77.9	76.9	77.7	80.7	74.5	73.0	74.7
Galveston, Tex.	84.1	81.9	79.6	77.9	75.8	75.5	75.0	74.1	73.3	77.2	75.8	79.4	77.5
Indianola, Tex.	83.2	81.9	81.8	80.5	78.8	79.5	79.2	77.3	79.3	80.8	78.6	82.2	80.3
Rio Grande Valley:													
Brownsville, Tex.	81.0	80.3	81.9	78.7	79.2	70.6	78.7	75.6	78.9	81.0	78.8	79.2	78.8
Ohio Valley and Tennessee:													
Chattanooga, Tenn.	84.8	70.6	63.2	65.4	67.3	74.3	72.6	78.1	77.3	76.3	69.6	70.4	71.6
Knoxville, Tenn.	79.9	73.8	66.9	65.1	67.7	74.4	75.4	75.4	73.0	76.6	71.5	76.1	73.1
Memphis, Tenn.	78.0	74.9	64.3	65.3	67.5	73.1	71.1	72.6	71.6	76.5	72.2	73.0	71.7
Nashville, Tenn.	72.9	73.3	66.9	66.3	66.4	73.3	73.9	74.1	72.1	74.5	73.5	76.5	72.5
Louisville, Ky.	74.3	69.3	63.3	60.9	69.8	73.9	70.4	70.1	71.4	74.7	69.5	71.5	70.5
Indianapolis, Ind.	72.6	72.5	64.2	61.0	63.2	66.8	65.9	67.2	67.7	71.8	70.5	75.8	69.3
Cincinnati, Ohio	78.0	75.2	66.8	64.6	67.3	68.0	63.5	64.1	66.7	71.1	73.0	75.8	69.3
Columbus, Ohio	74.1	72.0	65.4	64.0	65.4	68.1	64.0	65.5	68.7	72.8	70.4	74.2	69.7
Pittsburg, Pa.	79.0	74.7	68.8	62.5	65.6	68.2	68.3	70.3	69.9	71.8	70.5	72.1	70.7
Lower Lakes:													
Buffalo, N. Y.	83.7	81.8	76.0	73.4	72.4	72.4	74.9	72.1	76.5	75.9	76.7	78.0	76.2
Oswego, N. Y.	67.7	71.4	71.9	69.1	69.8	72.8	73.4	71.8	73.8	70.9	70.0	73.9	71.3

Mean relative humidity at stations of the Signal Service, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Lower Lakes—Continued:													
Erie, Pa.	80.0	79.1	74.6	71.3	69.7	70.5	72.1	71.6	72.7	74.8	74.0	78.6	74.1
Cleveland, Ohio	80.6	78.9	74.2	68.3	67.2	67.8	67.0	68.8	69.6	68.7	72.0	80.2	71.9
Toledo, Ohio	74.0	73.1	66.5	62.6	66.2	68.5	65.2	69.6	70.2	70.5	68.7	73.5	69.0
Detroit, Mich.	75.8	76.1	73.3	64.2	66.4	69.3	67.9	70.1	71.0	70.1	71.3	75.6	71.0
Upper Lakes:													
Alpena, Mich.	75.6	75.5	74.6	68.3	69.1	74.7	73.5	76.9	76.6	75.7	81.9	80.7	75.2
Escanaba, Mich.	77.1	75.2	73.0	68.6	68.9	71.8	73.1	77.6	78.2	74.8	75.4	77.5	74.1
Grand Haven, Mich.	80.8	80.6	77.7	65.3	67.9	73.2	74.8	78.1	75.9	75.4	76.1	81.0	75.6
Marquette, Mich.	67.1	67.7	67.2	66.6	62.5	66.4	69.1	73.2	72.4	69.5	71.3	73.3	68.8
Port Huron, Mich.	83.5	83.4	80.2	75.6	73.9	75.0	76.0	76.4	76.3	76.9	82.4	84.5	78.7
Chicago, Ill.	74.6	71.6	69.1	68.0	68.7	74.7	69.3	71.3	69.6	72.5	72.4	74.8	71.4
Milwaukee, Wis.	79.6	78.1	75.7	70.3	69.7	76.4	73.4	77.9	76.5	73.6	74.6	80.2	75.4
Duluth, Minn.	76.3	72.5	70.6	68.6	66.6	72.3	70.7	71.1	75.6	73.6	75.0	77.0	73.0
Upper Mississippi Valley:													
Saint Paul, Minn.	79.6	72.3	69.1	62.2	63.6	71.7	72.6	72.4	72.0	70.6	70.9	73.0	70.8
La Crosse, Wis.	72.7	68.5	67.8	57.0	56.4	63.2	66.2	70.8	72.3	69.1	71.0	73.5	67.3
Davenport, Iowa	60.3	63.0	61.7	61.7	67.0	73.9	70.7	71.2	70.4	72.1	68.1	68.4	67.4
Des Moines, Iowa	66.2	66.5	66.7	62.8	68.2	73.6	72.7	73.2	69.6	71.9	67.9	69.6	69.0
Lubucke, Iowa	60.0	63.0	64.1	57.9	63.1	70.0	67.7	69.8	70.3	70.0	66.9	65.8	65.7
Keokuk, Iowa	76.1	72.8	69.9	64.6	68.1	74.0	69.7	70.7	68.9	72.9	72.1	76.0	71.4
Keokuk, Ill.	79.4	76.1	68.8	65.9	69.4	76.8	76.2	74.9	75.1	77.0	72.2	74.6	73.9
Springfield, Ill.	72.0	71.0	65.1	61.6	66.3	73.7	67.9	69.1	66.5	71.2	67.2	72.1	68.6
Saint Louis, Mo.	73.8	79.4	75.6	71.5	77.9	79.1	75.1	77.1	71.2	73.9	76.3	77.5	76.5
Missouri Valley:													
Leavenworth, Kans.	71.1	67.0	63.4	61.0	64.7	70.3	68.7	71.0	65.0	70.6	68.6	74.4	68.0
Omaha, Nebr.	68.7	67.4	65.9	63.8	68.3	71.4	70.9	73.9	70.8	69.4	68.7	71.1	69.3
Bennett, Fort, Dak.	73.9	73.4	73.3	68.2	69.3	69.8	68.9	69.0	60.0	65.4	70.2	77.3	69.8
Huron, Dak.	64.2	67.0	70.4	70.3	71.2	73.3	75.5	74.3	69.5	68.9	69.0	67.0	70.1
Yankton, Dak.	66.2	67.3	68.0	66.9	67.1	70.8	71.3	71.6	67.4	68.0	69.2	70.7	68.7
Extreme Northwest:													
Moorhead, Minn.	88.8	83.4	82.5	73.2	65.7	67.7	72.6	71.7	71.2	74.6	77.9	83.3	76.1
Saint Vincent, Minn.	92.2	83.4	84.7	77.9	69.3	73.2	79.1	81.1	77.5	79.6	80.9	86.8	80.5
Bismarck, Dak.	80.7	79.5	76.7	71.3	63.0	69.9	69.3	67.1	67.3	73.2	80.4	76.8	72.9
Buford, Fort, Dak.	78.1	73.1	76.4	69.8	62.6	65.0	66.0	61.3	62.9	71.6	77.7	78.8	70.3
Northern Slope:													
Assinaboine, Fort, Mont.	64.9	66.0	68.3	61.8	58.0	55.8	51.9	50.9	57.1	60.4	61.2	60.5	60.0
Benton, Fort, Mont.	62.9	67.1	67.2	59.7	60.5	60.3	49.8	48.8	59.8	60.6	54.6	62.5	59.7
Helena, Mont.	73.5	75.2	68.7	65.4	58.2	58.7	54.0	44.7	54.3	64.0	66.8	71.0	62.9
Shaw, Fort, Mont.	67.4	67.9	63.9	61.1	59.6	56.4	50.7	50.5	59.9	62.8	59.0	61.8	60.2
Deadwood, Dak.	76.9	74.6	75.8	77.9	75.5	71.4	69.1	64.6	62.6	64.2	66.9	74.5	61.2
Cheyenne, Wyo.	53.0	52.8	49.0	57.4	59.5	59.1	47.7	50.3	40.6	51.2	45.9	59.6	52.2
North Platte, Nebr.	72.6	69.8	64.9	66.2	69.5	70.8	67.7	68.8	63.5	66.3	62.5	72.3	67.9
Middle Slope:													
Denver, Colo.	55.6	56.5	49.3	54.3	58.1	55.0	46.0	48.1	42.7	50.6	48.0	58.8	52.0
Pike's Peak, Colo.	70.1	79.2	79.7	82.9	86.1	80.9	69.5	74.4	75.9	81.5	73.0	81.7	78.6
Dodge City, Kans.	68.6	65.7	57.5	57.1	66.0	69.8	63.3	60.0	61.2	67.3	62.8	60.0	64.8
Elliot, Fort, Tex.	54.3	54.5	52.0	50.3	59.5	63.9	59.5	63.6	60.6	69.6	61.3	65.0	59.6
Southern Slope:													
Concho, Fort, Tex.	71.8	73.8	66.6	57.5	63.9	64.5	50.7	60.9	68.7	75.2	72.8	70.3	67.1
Davis, Fort, Tex.	55.9	52.4	50.5	44.2	44.4	50.0	53.2	59.7	62.5	61.3	62.2	57.9	54.5
Stockton, Fort, Tex.	65.8	63.4	58.5	50.7	61.0	62.9	60.5	64.2	70.1	69.7	68.4	63.1	63.2
Southern Plateau:													
El Paso, Tex.	53.4	52.2	41.4	30.8	29.4	33.4	42.0	51.2	54.3	54.9	59.4	55.0	46.5
Pasco, Fort, Ariz.	67.3	67.2	65.1	51.0	48.1	44.9	54.5	65.6	56.9	58.9	58.9	67.7	58.6
Grant, Fort, Ariz.	53.5	59.4	47.8	32.6	29.7	30.8	42.4	56.1	42.7	44.2	54.7	56.1	45.2
Prescott, Ariz.	57.4	63.7	59.0	48.0	42.2	38.5	53.1	58.7	47.3	51.5	64.3	63.8	53.1
Thomas, Camp, Ariz.	67.3	68.7	59.4	41.9	39.3	35.3	40.8	51.9	46.5	46.8	59.4	67.9	52.1
Middle Plateau:													
Salt Lake City, Utah	55.0	54.2	51.4	54.3	43.1	36.7	31.6	36.8	39.6	54.1	51.9	58.4	47.3
Northern Plateau:													
Lewiston, Idaho	71.1	68.9	65.8	61.4	56.8	53.2	44.1	43.2	55.2	70.4	75.6	77.5	61.9
Denton, Wash.	81.3	75.2	72.3	65.8	59.8	58.7	50.5	48.4	57.0	61.2	81.5	83.2	67.1
Spokane Falls, Wash.	81.6	79.0	77.1	69.2	61.5	58.0	49.8	48.2	60.4	75.0	80.2	80.3	68.4
North Pacific Coast:													
Olympia, Wash.	83.4	80.8	80.2	79.7	72.7	69.0	65.8	68.6	78.1	83.2	85.1	84.1	77.5
Portland, Oreg.	81.6	77.6	74.5	71.1	63.7	65.5	65.5	66.6	74.8	82.8	82.8	81.9	74.0
Middle Pacific Coast:													
Red Bluff, Cal.	71.9	68.4	65.1	63.3	53.0	45.6	34.7	35.4	49.2	59.7	69.7	73.6	57.5
Sacramento, Cal.	77.7	74.0	70.6	68.3	65.1	62.9	57.2	58.6	60.1	71.0	75.7	80.7	68.6
San Francisco, Cal.	76.0	71.0	75.7	75.6	74.7	73.8	79.5	83.1	78.8	79.7	79.7	78.7	77.5
South Pacific Coast:													
Los Angeles, Cal.	61.5	65.1	73.8	73.2	71.2	72.2	70.8	70.0	68.8	68.0	63.2	65.3	68.6
San Diego, Cal.	64.3	67.7	75.0	74.1	73.6	75.1	76.0	77.1	75.1	71.9	69.8	68.8	72.4
Alaska Stations:													
Saint Michael's, Ft., Alaska	96.1	96.5	95.2	93.6	90.0	83.5	83.6	85.7	87.4	89.0	92.6	92.5	90.5
Sitka, Alaska	75.2	74.5	71.3	67.1	73.1	75.9	79.0	80.8	80.7	75.7	76.0	74.3	75.3

APPENDIX 39.

Average dew-point (in degrees Fahrenheit) at stations of the Signal Service, United States Army, for each month and the year. (Computed from January, 1882, to and including December, 1884.)

[The daily means are obtained by dividing the sum of 7 a. m., 3 and 11 p. m. (Washington time) observations by 3; the monthly, by dividing the sum of the daily by the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
New England:	o	o	o	o	o	o	o	o	o	o	o	o	o
Eastport, Me.	11.2	16.0	19.2	29.6	37.2	47.7	53.1	53.4	48.0	38.4	29.4	18.6	33.5
Portland, Me.	14.8	19.3	21.1	31.4	40.1	53.4	58.4	57.8	51.7	40.8	30.3	21.5	36.7
Mount Washington, N. H.	-0.4	5.5	5.5	18.0	28.2	40.4	43.7	43.3	37.0	27.0	14.0	7.9	22.5
Boston, Mass.	17.8	22.7	24.1	33.5	43.0	55.9	59.8	58.2	53.4	42.3	31.1	23.1	38.6
Block Island, R. I.	23.9	27.6	27.7	36.2	45.8	57.7	62.6	62.2	58.1	48.1	37.6	29.8	43.1
New Haven, Conn.	16.8	22.3	23.0	32.7	43.2	56.2	60.2	59.2	54.9	43.7	30.9	22.9	38.9
New London, Conn.	19.5	25.7	26.7	35.2	44.3	57.2	61.4	61.0	56.9	47.3	33.8	24.9	41.2
Middle Atlantic States:													
Albany, N. Y.	14.5	21.0	21.2	31.7	41.9	55.6	58.6	57.5	52.8	40.6	29.3	20.9	37.3
New York City	21.8	27.6	27.9	35.8	45.9	57.9	61.6	60.4	56.9	46.4	34.1	26.5	41.9
Philadelphia, Pa.	23.5	30.5	31.0	40.6	53.1	63.2	65.3	64.3	59.0	48.6	34.8	27.9	45.3
Atlantic City, N. J.	23.9	30.5	30.9	39.3	48.8	60.5	64.9	64.9	61.2	51.5	37.2	29.5	45.3
Barnegat City, N. J.	25.2	31.2	30.1	37.9	48.5	59.9	64.7	64.8	61.3	51.8	38.1	30.4	45.3
Cape May, N. J.	27.8	33.3	34.0	41.6	50.7	61.5	66.0	65.7	61.7	52.8	39.6	33.0	47.3
Sandy Hook, N. J.	23.0	29.1	28.9	38.3	47.7	59.8	63.2	63.0	59.0	49.2	35.8	28.3	43.8
Delaware Breakwater, Del.	23.6	34.0	33.7	40.8	50.5	61.7	65.6	65.0	62.4	53.5	39.9	32.0	47.4
Baltimore, Md.	24.0	30.2	30.0	38.0	48.2	60.2	62.8	62.4	57.6	49.1	34.0	27.3	43.7
Washington City.	24.9	31.6	30.9	39.4	50.0	61.5	63.8	63.1	59.0	49.3	35.3	28.1	44.8
Cape Henry, Va.	32.8	39.0	37.0	44.5	53.5	64.2	67.8	68.4	67.4	56.5	42.2	35.4	50.5
Chincoteague, Va.	39.8	35.1	34.3	41.4	52.3	64.2	67.8	67.4	63.5	55.0	40.5	32.9	48.7
Lynchburg, Va.	25.1	32.2	30.7	41.4	51.0	61.9	62.6	61.9	57.5	50.0	32.8	27.7	44.6
Norfolk, Va.	32.5	39.0	37.0	44.6	54.3	64.4	68.6	68.0	64.0	56.3	41.7	35.0	50.5
South Atlantic States:													
Charlotte, N. C.	32.7	39.6	37.6	45.3	52.9	62.2	64.4	63.7	60.2	53.2	37.4	32.9	48.5
Hatteras, N. C.	40.1	45.0	43.4	49.5	58.8	68.4	71.0	71.3	68.1	61.3	48.3	42.7	55.7
Kitty Hawk, N. C.	35.5	41.1	38.9	45.4	55.7	65.8	69.7	69.5	66.3	58.7	44.7	38.3	52.5
Macon, Fort, N. C.	39.3	45.5	44.4	51.8	60.7	69.0	72.4	71.9	68.3	61.3	47.5	41.2	56.1
Smithville, N. C.	40.6	46.8	45.5	53.3	61.1	68.7	72.5	71.6	67.8	60.1	45.5	41.7	56.3
Wilmington, N. C.	39.5	45.3	43.7	50.7	58.9	66.9	71.4	70.5	66.6	59.2	44.2	39.0	54.7
Charleston, S. C.	44.4	50.1	49.5	56.2	62.9	70.3	74.1	72.8	69.8	63.1	49.2	46.2	59.0
Augusta, Ga.	38.8	44.7	43.9	51.2	57.6	66.8	68.9	68.2	65.7	57.5	42.7	39.6	53.8
Savannah, Ga.	42.9	47.5	46.2	54.5	60.7	68.7	71.4	70.8	67.4	60.9	45.9	43.7	56.7
Jacksonville, Fla.	49.5	53.0	52.2	59.4	63.5	70.5	73.2	72.2	69.6	65.5	53.5	50.7	61.1
Florida Peninsula:													
Cedar Keys, Fla.	51.4	55.4	55.9	62.1	64.6	71.2	73.4	73.1	70.2	66.6	55.6	53.4	62.7
Key West, Fla.	64.3	65.4	64.0	67.0	69.0	73.0	73.8	74.1	73.9	71.8	67.7	65.3	69.1
Eastern Gulf States:													
Atlanta, Ga.	34.2	40.1	40.1	47.3	53.5	63.6	65.3	65.1	59.8	54.9	37.9	34.3	49.7
Pensacola, Fla.	45.8	52.1	53.0	59.8	63.6	71.6	72.9	72.6	68.6	63.4	47.8	46.9	59.8
Mobile, Ala.	44.4	49.8	51.4	58.0	62.2	70.5	71.8	70.6	67.0	62.6	49.1	45.8	58.6
Montgomery, Ala.	39.9	45.7	45.5	53.0	57.3	67.4	69.3	68.8	63.0	57.3	43.7	40.9	54.3
Vicksburg, Miss.	38.6	45.0	46.3	54.2	60.1	69.1	71.2	69.1	65.0	60.4	45.7	41.4	53.5
New Orleans, La.	46.4	51.8	53.3	59.8	64.0	70.9	72.4	71.3	68.3	64.8	50.4	48.0	60.1
Western Gulf States:													
Shreveport, La.	36.1	43.7	46.7	54.1	61.1	69.1	70.8	68.6	63.2	59.4	46.0	38.9	54.8
Little Rock, Ark.	32.0	40.6	42.5	51.2	58.4	69.0	71.5	68.5	64.3	59.5	44.7	35.8	53.2
Galveston, Tex.	47.2	53.4	58.0	62.4	66.9	73.1	75.0	73.8	70.7	67.7	55.4	51.6	62.9
Indianola, Tex.	46.1	53.6	59.5	63.7	68.2	73.8	75.4	74.0	71.7	68.8	57.1	50.9	63.6
Palatine, Tex.	31.4	39.8	47.4	54.4	61.6	69.1	71.5	67.5	63.5	59.3	46.0	38.5	54.1
Rio Grande Valley:													
Brownsville, Tex.	50.4	57.2	62.5	65.7	70.2	74.1	74.8	72.8	70.7	69.5	59.9	54.7	65.2
Ohio Valley and Tennessee:													
Chattanooga, Tenn.	32.3	39.2	38.8	47.2	53.9	64.8	66.3	66.3	62.7	56.1	39.3	33.0	50.0
Knoxville, Tenn.	30.9	37.7	36.3	44.2	52.1	63.0	64.9	63.6	59.4	54.4	37.1	31.1	47.9
Memphis, Tenn.	31.8	39.8	39.8	48.8	56.1	67.5	69.1	66.7	61.9	57.6	42.7	34.5	51.4
Nashville, Tenn.	31.0	38.7	38.4	46.8	53.8	65.4	67.2	66.4	61.0	55.5	40.7	33.6	49.6
Louisville, Ky.	25.4	33.5	33.3	41.6	53.0	64.3	64.8	62.6	59.1	52.9	38.1	29.8	46.5
Indianapolis, Ind.	18.2	28.0	28.6	38.1	46.8	59.7	60.9	59.5	54.5	47.4	33.6	24.5	41.7
Cincinnati, Ohio.	25.4	34.4	33.5	41.6	49.6	61.8	61.7	60.2	57.0	50.5	37.4	29.5	45.3
Columbus, Ohio.	19.1	28.8	28.2	37.1	46.5	58.6	58.6	57.9	54.6	47.2	32.6	25.0	41.2
Pittsburg, Pa.	22.9	39.4	29.0	36.6	47.1	58.8	59.6	59.3	54.8	47.2	34.0	28.1	42.3
Lower Lakes:													
Buffalo, N. Y.	17.4	22.4	22.5	31.6	41.0	54.8	58.0	57.5	53.6	43.8	32.5	24.2	38.2
Orwego, N. Y.	14.8	21.1	22.8	31.4	41.5	55.2	58.0	57.7	52.1	41.7	30.2	21.7	37.3
Erie, Pa.	19.4	25.5	25.7	34.2	43.5	56.4	59.0	58.6	53.9	44.8	33.9	26.4	42.3

Average dew-point (in degrees Fahrenheit) at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Lower Lakes—Continued:	°	°	°	°	°	°	°	°	°	°	°	°	°
Cleveland, Ohio.....	17.9	25.1	25.5	32.4	42.0	55.6	57.6	57.4	52.6	43.7	31.6	24.2	38.9
Toledo, Ohio.....	17.2	24.5	25.2	33.6	44.2	58.0	58.1	54.2	45.1	32.0	23.3	24.7	38.6
Detroit, Mich.....	18.1	25.4	27.3	33.5	43.8	57.8	58.5	58.6	54.0	44.8	32.2	24.7	39.9
Upper Lakes:													
Alpena, Mich.....	9.3	13.2	15.9	26.1	35.2	50.5	53.4	54.9	49.1	39.0	28.4	18.4	32.8
Escanaba, Mich.....	6.6	9.8	14.8	23.3	35.5	50.6	54.3	55.4	49.8	39.1	25.7	15.0	31.9
Grand Haven, Mich.....	18.1	22.9	25.2	32.0	41.3	54.9	58.4	59.0	53.4	44.1	32.6	24.0	38.8
Marquette, Mich.....	5.2	8.4	13.0	25.5	32.5	45.3	50.6	53.0	47.3	30.7	24.8	14.4	29.7
Port Huron, Mich.....	14.7	20.9	22.9	31.8	40.7	54.3	57.1	57.8	52.6	42.7	31.6	22.0	37.4
Chicago, Ill.....	14.5	21.3	25.1	34.4	42.7	55.5	58.6	59.1	54.0	45.6	32.3	21.1	38.7
Milwaukee, Wis.....	11.9	19.8	24.3	32.6	40.1	53.4	56.9	58.6	53.2	43.8	30.0	10.0	36.9
Duluth, Minn.....	1.3	7.8	15.8	27.8	35.1	48.6	52.9	55.5	48.7	38.0	24.0	8.3	30.3
Upper Mississippi Valley:													
Saint Paul, Minn.....	4.2	10.2	18.7	32.4	41.6	56.6	58.7	58.8	50.7	39.7	24.2	9.5	33.8
La Crosse, Wis.....	5.7	14.0	21.0	32.1	39.7	55.0	58.0	58.8	53.1	41.6	27.5	13.2	35.0
Davenport, Iowa.....	9.2	19.1	24.8	37.2	46.2	59.8	61.2	60.1	54.2	45.5	31.2	18.8	39.0
Des Moines, Iowa.....	8.1	15.8	24.8	37.1	45.2	58.9	61.1	59.6	52.5	43.5	28.4	14.6	37.4
Dubuque, Iowa.....	4.1	14.1	22.0	33.1	42.3	56.8	58.4	58.1	52.2	42.5	27.3	13.7	35.4
Keokuk, Iowa.....	14.7	22.0	28.5	39.9	48.0	61.5	63.1	61.3	54.9	40.6	32.9	20.6	41.1
Cairo, Ill.....	27.0	35.8	37.3	46.4	54.0	66.9	68.6	65.8	61.3	54.7	39.9	30.8	48.0
Springfield, Ill.....	18.6	25.7	29.5	39.6	47.8	61.3	61.7	59.8	53.8	47.2	32.2	22.9	41.6
Saint Louis, Mo.....	21.0	30.6	35.0	45.3	54.1	65.2	66.5	65.2	58.9	52.7	39.3	28.2	46.8
Missouri Valley:													
Leavenworth, Kans.....	16.0	22.8	29.6	39.4	47.2	61.2	63.7	61.7	54.1	46.5	32.9	22.6	41.4
Omaha, Nebr.....	10.4	15.9	25.5	37.6	46.9	60.2	63.1	62.0	54.9	43.9	29.5	15.0	38.7
Bennett, Fort, Dak.....	5.0	9.1	21.5	33.0	42.7	56.5	57.7	56.1	44.7	34.9	21.3	10.0	32.2
Huron, Dak.....	-0.1	5.6	19.1	33.6	42.5	56.7	58.4	58.0	47.4	36.5	21.6	5.2	32.0
Yankton, Dak.....	5.2	12.4	21.5	34.6	43.5	58.2	60.2	60.1	50.0	39.3	24.9	9.8	35.0
Extreme Northwest:													
Moorhead, Minn.....	-5.4	-1.1	11.5	30.2	38.4	52.5	55.0	54.9	45.7	34.8	18.5	2.0	28.3
Saint Vincent, Minn.....	-9.0	-4.9	6.8	27.5	38.0	52.1	54.4	56.0	45.4	34.1	16.3	-1.1	26.3
Bismarck, Dak.....	-0.6	4.1	14.7	30.1	38.3	54.5	54.6	54.8	45.0	34.6	21.7	4.4	29.7
Burford, Fort, Dak.....	-0.6	1.5	15.1	29.7	38.5	51.8	52.1	51.7	40.3	32.4	19.9	3.3	27.9
Northern Slope:													
Aassinaboine, Fort, Mont.....	2.1	2.6	16.1	27.4	36.2	45.5	45.1	45.7	36.5	27.9	18.3	5.1	25.7
Benton, Fort, Mont.....	5.6	7.9	21.9	27.7	38.1	48.3	45.9	47.6	39.6	29.2	17.7	6.1	28.0
Helena, Mont.....	9.5	10.7	21.7	29.4	35.8	45.9	47.3	44.6	38.5	30.0	22.8	12.4	29.0
Shaw, Fort, Mont.....	9.5	7.9	17.5	25.5	34.0	43.8	41.2	43.1	36.0	27.8	19.3	7.8	26.1
Deadwood, Dak.....	13.4	13.3	23.1	30.0	38.8	49.4	51.4	50.0	40.5	32.0	23.5	14.1	31.6
Cheyenne, Wyo.....	7.8	9.2	14.3	21.9	31.4	42.4	39.0	40.5	27.7	23.8	13.2	11.3	23.5
North Platte, Nebr.....	12.0	14.1	24.0	34.2	44.1	57.5	59.7	57.6	48.5	38.2	23.9	15.9	35.8
Middle Slope:													
Denver, Colo.....	14.5	14.1	21.4	26.9	36.7	46.6	47.3	46.6	36.8	30.6	20.3	16.3	29.8
Pike's Peak, Colo.....	-4.6	-1.2	3.5	7.0	16.4	25.3	29.1	29.5	23.6	15.4	6.1	2.0	12.6
Dodge City, Kans.....	16.1	18.8	26.5	34.1	45.0	59.7	61.0	60.2	51.2	42.4	27.1	18.8	33.5
Elliott, Fort, Tex.....	14.7	19.6	27.3	33.6	45.1	58.0	60.1	58.4	52.0	46.0	29.9	21.1	38.8
Southern Slope:													
Concho, Fort, Tex.....	31.3	39.2	44.0	44.3	55.0	64.3	62.0	62.2	60.1	56.1	43.2	33.6	49.7
Davis, Fort, Tex.....	24.5	29.2	32.0	29.0	39.2	50.6	55.2	54.1	51.5	44.7	35.3	28.0	39.5
Stockton, Fort, Tex.....	29.0	35.2	39.4	38.9	52.8	62.2	64.2	61.9	58.4	51.7	40.0	31.4	47.1
Southern Plateau:													
El Paso, Tex.....	23.9	29.4	18.2	24.5	31.4	43.7	54.9	56.3	50.5	41.5	34.5	27.4	37.2
Apache, Fort, Ariz.....	23.4	27.8	32.0	27.4	32.7	39.7	51.5	55.1	43.6	34.4	27.1	25.4	35.0
Grant, Fort, Ariz.....	24.1	29.4	20.2	24.0	29.0	38.4	50.4	54.8	43.9	30.3	30.3	28.4	34.9
Prescott, Ariz.....	19.0	24.4	28.0	24.8	29.3	36.2	51.4	52.0	38.6	31.0	24.0	24.2	31.9
Thomas, Camp, Ariz.....	29.7	35.4	37.7	31.3	37.0	43.1	54.7	58.7	49.1	38.2	35.1	32.4	40.2
Middle Plateau:													
Salt Lake City, Utah.....	12.0	13.3	24.3	29.7	33.0	39.2	40.7	45.2	37.2	31.8	22.3	21.3	29.1
Northern Plateau:													
Lewiston, Idaho.....	21.7	17.8	32.6	36.5	42.3	48.7	47.1	47.4	42.1	38.7	32.2	23.5	35.9
Dayton, Wash.....	24.2	17.9	32.8	35.3	41.5	47.8	40.3	45.6	41.1	37.7	33.4	24.1	35.6
Spokane Falls, Wash.....	18.9	16.8	30.8	36.0	41.5	48.1	46.5	45.6	41.5	36.9	31.1	20.9	34.6
North Pacific Coast:													
Olympia, Wash.....	33.0	29.3	37.4	41.4	44.7	48.4	49.0	51.4	48.8	44.2	40.2	33.9	41.8
Portland, Oreg.....	33.1	28.9	38.1	40.2	44.0	50.2	52.4	52.5	49.8	45.4	40.2	34.1	42.4
Middle Pacific Coast:													
Red Bluff, Cal.....	33.8	33.9	40.6	42.3	45.4	49.1	48.0	47.6	44.6	43.2	40.6	36.0	42.3
Sacramento, Cal.....	37.3	37.9	44.0	44.8	50.4	54.5	55.4	55.5	52.6	48.8	43.8	40.7	47.5
San Francisco, Cal.....	40.4	39.2	45.1	45.4	48.5	51.4	52.4	52.7	52.4	50.7	47.0	44.4	47.5
South Pacific Coast:													
Los Angeles, Cal.....	37.2	39.2	46.0	47.0	50.8	55.8	58.1	58.9	55.7	49.3	43.6	41.3	48.6
San Diego, Cal.....	30.5	41.8	47.9	48.4	52.2	56.0	59.7	61.7	58.2	51.3	46.8	43.9	50.6
Alaska Stations:													
Saint Michael's, Fort, Alaska.....	9.3	10.0	14.0	17.0	32.6	41.2	48.8	47.9	39.6	28.7	14.6	2.7	25.2
Sitka, Alaska.....	29.5	25.3	28.1	31.8	38.4	43.5	47.2	49.3	45.2	37.2	31.7	27.8	36.2

APPENDIX 40.

Dates of the first light frost at stations of the Signal Service, United States Army, east of the Rocky Mountains for the winter of 1884-'85.

Stations.	Latitude.	Longitude.	Date.	Stations.	Latitude.	Longitude.	Date.
New England:	° ' /	° ' /		Lower Lakes:	° ' /	° ' /	
Eastport, Me.	44 54	66 59	Oct. 15	Buffalo, N. Y.	42 53	78 53	Sept. 19
Portland, Me.	43 39	70 15	Oct. 15	Oswego, N. Y.	43 29	76 35	Sept. 19
Mount Washington, N. H.	44 16	71 18	July 29	Rochester, N. Y.	43 8	77 42	Sept. 19
Boston, Mass.	42 21	71 4	Oct. 10	Erie, Pa.	42 7	80 5	Oct. 7
Block Island, R. I.	41 10	71 36	Nov. 10	Cleveland, Ohio.	41 30	81 42	Oct. 15
New Haven, Conn.	41 18	72 56	Oct. 24	Sandusky, Ohio.	41 25	82 40	Oct. 10
New London, Conn.	41 21	72 5	Oct. 10	Toledo, Ohio.	41 40	83 34	Oct. 9
Middle Atlantic States:				Detroit, Mich.	42 20	83 3	Oct. 9
Albany, N. Y.	42 39	73 45	Oct. 9	Upper Lakes:			
New York City.	40 43	74 0	(¹)	Alpena, Mich.	45 5	83 30	Aug. 9
Philadelphia, Pa.	39 57	75 9	Nov. 10	Escanaba, Mich.	45 48	87 5	Aug. 7
Atlantic City, N. J.	39 22	74 25	Oct. 26	Grand Haven, Mich.	43 5	86 18	Sept. 21
Barneget City, N. J.	39 46	74 6	Oct. 26	Mackinaw City, Mich.	45 47	84 39	Oct. 14
Cape May, N. J.	38 56	74 58	Oct. 10	Marquette, Mich.	46 34	87 24	Sept. 29
Sandy Hook, N. J.	40 28	74 0	Oct. 15	Port Huron, Mich.	43 0	82 26	Aug. 24
Delaware Breakwater, Del.	38 48	75 10	Oct. 16	Chicago, Ill.	41 52	87 38	Nov. 6
Baltimore, Md.	39 18	76 37	Nov. 21	Milwaukee, Wis.	43 2	87 54	Nov. 2
Washington City.	38 54	77 2	Oct. 10	Duluth, Minn.	46 48	92 6	Nov. 3
Cape Henry, Va.	36 56	76 0	Jan. 11	Upper Mississippi Valley:			
Chincoteague, Va.	37 55	75 23	(¹)	Saint Paul, Minn.	44 38	93 3	Oct. 9
Lynchburg, Va.	37 25	79 9	Oct. 16	La Crosse, Wis.	43 49	91 15	Oct. 14
Norfolk, Va.	36 51	76 17	Oct. 25	Davenport, Iowa.	41 30	90 38	Oct. 9
South Atlantic States:				Des Moines, Iowa.	41 35	93 37	Oct. 9
Charlotte, N. C.	35 13	80 51	Oct. 16	Dubuque, Iowa.	42 30	90 44	Oct. 9
Hatteras, N. C.	35 15	75 40	Jan. 2	Keokuk, Iowa.	40 22	91 26	Oct. 9
Kitty Hawk, N. C.	36 0	75 42	Nov. 1	Cairo, Ill.	37 0	89 10	Nov. 5
Macon, Fort, N. C.	34 42	76 40	Dec. 10	Springfield, Ill.	39 48	89 39	Oct. 10
Smithville, N. C.	33 55	78 1	Jan. 22	Saint Louis, Mo.	38 38	90 12	Oct. 22
Wilmington, N. C.	34 14	77 57	Oct. 25	Missouri Valley:			
Charleston, S. C.	32 47	79 56	Oct. 25	Leavenworth, Kans.	39 19	94 57	Oct. 9
Augusta, Ga.	33 28	81 54	Oct. 16	Omaha, Nebr.	41 16	95 56	Oct. 22
Savannah, Ga.	32 5	81 5	Oct. 25	Bennett, Fort, Dak.	44 43	100 39	Sept. 27
Jacksonville, Fla.	30 20	81 39	Nov. 25	Huron, Dak.	44 21	98 9	Sept. 11
Florida Peninsula:				Yankton, Dak.	42 54	97 28	Oct. 8
Cedar Keys, Fla.	29 8	83 2	Dec. 20	Extreme Northwest:			
Key West, Fla.	24 34	81 49	(²)	Moorhead, Minn.	46 52	96 44	Sept. 29
Sanford, Fla.	28 48	81 23	Dec. 3	Saint Vincent, Minn.	46 56	97 14	Aug. 23
Eastern Gulf States:				Bismarck, Dak.	46 47	100 28	Sept. 9
Atlanta, Ga.	33 45	84 23	Oct. 24	Buford, Fort, Dak.	48 0	103 56	Sept. 9
Pensacola, Fla.	30 25	87 13	Nov. 21	Totten, Fort, Dak.	47 57	98 57	Sept. 29
Mobile, Ala.	30 41	88 2	Nov. 8	Northern Slope:			
Montgomery, Ala.	32 23	86 18	Oct. 17	Assinaboine, Fort, Mont.	46 32	109 42	Sept. 7
Vicksburg, Miss.	32 22	90 53	Oct. 24	Benton, Fort, Mont.	47 50	110 40	Nov. 10
New Orleans, La.	29 58	90 4	Nov. 7	Custer, Fort, Mont.	45 42	107 84	Oct. 7
Western Gulf States:				Helena, Mont.	46 34	112 4	Sept. 6
Shreveport, La.	32 30	93 40	Nov. 6	Maginnis, Fort, Mont.	47 12	109 10	Sept. 7
Fort Smith, Ark.	35 22	94 24	Oct. 24	Shaw, Fort, Mont.	48 8	105 10	Sept. 4
Little Rock, Ark.	34 45	92 6	Oct. 24	Deadwood, Dak.	47 31	111 48	Oct. 7
Galveston, Tex.	29 18	94 47	Nov. 8	Chayenna, Wyo.	44 23	103 43	Aug. 21
Indianola, Tex.	28 32	96 31	Jan. 26	North Platte, Nebr.	41 8	104 48	Sept. 10
Palestine, Tex.	31 45	95 40	Nov. 7	Middle Slope:			
Rio Grande Valley:				Denver, Colo.	39 45	105 0	Sept. 9
Brownsville, Tex.	25 53	97 26	Jan. 18	Pike's Peak, Colo.	38 50	105 2	(³)
Rio Grande City, Tex.	26 23	98 48	(²)	West Las Animas, Colo.	38 4	103 12	Oct. 9
Ohio Valley and Tennessee:				Dodge City, Kans.	37 45	100 0	Oct. 5
Chattanooga, Tenn.	35 4	85 15	Oct. 23	Elliot, Fort, Tex.	35 30	100 21	Oct. 23
Knoxville, Tenn.	35 56	83 58	Oct. 23	Southern Slope:			
Memphis, Tenn.	35 9	90 3	Oct. 23	Sill, Fort, Ind. T.	34 40	98 23	Nov. 7
Nashville, Tenn.	36 10	86 47	Oct. 16	Concho, Fort, Tex.	31 25	100 34	Nov. 9
Louisville, Ky.	38 15	85 45	Oct. 19	Davis, Fort, Tex.	30 38	103 56	Nov. 8
Greencastle, Ind.	39 40	86 53	Oct. 24	Stockton, Fort, Tex.	30 53	102 53	Nov. 6
Indianapolis, Ind.	39 46	86 10	Oct. 15	Southern Plateau:			
Cincinnati, Ohio.	39 6	84 30	Nov. 8	El Paso, Tex.	31 47	106 30	Oct. 25
Columbus, Ohio.	39 58	83 0	Oct. 15				
Pittsburg, Pa.	40 32	80 2	Oct. 10				

¹None reported.²No frost observed.³Every month in the year.

APPENDIX 41.

Dates of the first killing frost at stations of the Signal Service, United States Army, east of the Rocky Mountains for each winter from 1873-'74 to 1884-'85.

Stations.	Latitude.	Longitude.	WINTER OF —											
			1873-'74.	1874-'75.	1875-'76.	1876-'77.	1877-'78.	1878-'79.	1879-'80.	1880-'81.	1881-'82.	1882-'83.	1883-'84.	1884-'85.
New England:														
Eastport, Me.	44 54	66 59	Nov. 4	Nov. 12	Oct. 3	Oct. 9	Oct. 26	Sept. 8	Sept. 26	Oct. 26	Oct. 20	Oct. 5	Oct. 2	Sept. 20
Portland, Me.	43 39	70 15	Nov. 4	Nov. 3	Oct. 14	Oct. 2	Oct. 17	Oct. 29	Sept. 26	Oct. 28	Oct. 27	Oct. 28	Nov. 1	Oct. 10
Mount Washington, N. H.	44 16	71 18	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	July 28
Boston, Mass.	42 21	71 4	Oct. 9	Nov. 12	Oct. 18	Oct. 12	Oct. 28	Oct. 29	Sept. 26	Oct. 1	Oct. 5	Nov. 3	Oct. 3	Oct. 19
Block Island, R. I.	41 10	71 36	Oct. 26	Oct. 5	Oct. 13	Oct. 12	Nov. 7	Nov. 27	Oct. 25	Oct. 25	Nov. 18	Dec. 19	Nov. 19	Nov. 24
New Haven, Conn.	41 18	72 56	Nov. 4	Nov. 2	Oct. 18	Oct. 7	Oct. 6	Oct. 29	Oct. 25	Oct. 25	Oct. 5	Nov. 5	Oct. 5	Oct. 10
New London, Conn.	41 21	72 5										Nov. 3	Oct. 5	Oct. 19
Middle Atlantic States:														
Albany, N. Y.	42 39	73 45		Oct. 20	Oct. 18	Oct. 18	Oct. 23	Oct. 7	Sept. 26	Nov. 10	Nov. 21	Nov. 8	Oct. 16	Oct. 19
New York City.	40 43	74 0	Nov. 7	Nov. 13	Nov. 2	Oct. 15	Nov. 30	Nov. 4	Oct. 25	Nov. 23	Oct. 27	Nov. 19	Nov. 15	Nov. 7
Philadelphia, Pa.	39 57	75 9	Oct. 29	Nov. 8	Oct. 14	Oct. 12	Oct. 23	Oct. 29	Oct. 25	Nov. 16	Oct. 16	Nov. 6	Nov. 18	Nov. 22
Atlantic City, N. J.	39 22	74 25		Oct. 15	Nov. 2	Oct. 15	Nov. 7	Oct. 29	Oct. 25	Oct. 25	Nov. 16	Nov. 16	Nov. 18	Nov. 6
Barnegat City, N. J.	39 46	74 6		Nov. 13	Nov. 1	Oct. 15	Nov. 7	Nov. 9	Oct. 25	Nov. 16	Nov. 16	Nov. 21	Nov. 18	Nov. 21
Cape May, N. J.	38 56	74 53	Oct. 30	Nov. 8	Nov. 3	Nov. 30	Nov. 20	Oct. 29	Nov. 4	Dec. 2	Nov. 16	Nov. 21	Nov. 13	Nov. 22
Sandy Hook, N. J.	40 28	74 0		Nov. 16	Nov. 8	Nov. 30	Nov. 30	Nov. 4	Nov. 4	Nov. 18	Nov. 25	Nov. 23	Nov. 3	Oct. 24
Delaware Breakwater, Del.	38 48	75 10								Nov. 19	Nov. 25	Nov. 23	Nov. 15	Nov. 20
Baltimore, Md.	39 18	76 37	Oct. 29	Nov. 10	Nov. 3	Oct. 15	Nov. 4	Dec. 6	Oct. 26	Nov. 8	Nov. 27	Nov. 19	Nov. 13	Nov. 7
Washington City.	38 54	77 2	Oct. 30	Oct. 15	Oct. 13	Oct. 12	Oct. 23	Oct. 6	Oct. 31	Oct. 19	Nov. 5	Nov. 15	Nov. 15	Oct. 19
Cape Henry, Va.	36 56	76 0		Nov. 30	Nov. 30	Nov. 27	Nov. 30	Dec. 6	Nov. 30	Oct. 16	Nov. 25	Nov. 15	Dec. 15	Dec. 18
Chincoteague, Va.	37 55	75 23								Dec. 11	Nov. 25	Nov. 15	Dec. 17	Nov. 21
Lynchburg, Va.	37 25	79 9	Oct. 30	Oct. 14	Nov. 6	Oct. 3	Nov. 29	Nov. 4	Oct. 25	Oct. 19	Nov. 16	Nov. 20	Nov. 15	Oct. 24
Norfolk, Va.	36 51	76 17	Nov. 14	Nov. 30	Nov. 18	Oct. 15	Nov. 30	Nov. 4	Nov. 4	Nov. 16	Nov. 17	Nov. 15	Nov. 30	Oct. 21
South Atlantic States:														
Charlotte, N. C.	35 13	80 51						Nov. 1	Oct. 26	Oct. 18	Nov. 4	Nov. 19	Nov. 2	Oct. 24
Hatteras, N. C.	35 15	76 40									Jan. 4	Nov. 26	Dec. 16	Dec. 19
Kitty Hawk, N. C.	36 0	75 42						Dec. 4	Nov. 20	Nov. 16	Nov. 4	Nov. 9	Dec. 16	Dec. 4
Macon, Fort, N. C.	34 42	76 40							(¹)	Nov. 25	Nov. 25	Nov. 23	Dec. 13	Dec. 18
Smithville, N. C.	33 55	78 1						Dec. 1	Nov. 4	Oct. 25	Nov. 25	Nov. 23	Dec. 13	Jan. 3
Wilmington, N. C.	34 14	77 57						Dec. 1	Nov. 1	Nov. 16	Nov. 24	Nov. 20	Dec. 13	Jan. 24
Charlotte, S. C.	33 47	79 56	Nov. 14	Dec. 1	Nov. 12	Nov. 26	Nov. 13	Dec. 11	Nov. 31	Nov. 23	Nov. 26	Dec. 8	Nov. 17	Dec. 19
Charleston, S. C.	32 47	79 56	Nov. 21	Dec. 8	Dec. 11	Dec. 20	Nov. 30	Dec. 11	Nov. 21	Nov. 23	Nov. 26	Dec. 8	Nov. 17	Dec. 19
Augusta, Ga.	33 28	81 54	Oct. 8	Nov. 11	Dec. 10	Nov. 11	Nov. 28	Oct. 28	Nov. 5	Nov. 16	Nov. 26	Nov. 23	Dec. 17	Oct. 25
Savannah, Ga.	32 5	81 5	Nov. 20	Jan. 80	Dec. 10	Dec. 20	Nov. 30	Nov. 2	Nov. 23	Nov. 16	Jan. 4	Nov. 23	Dec. 17	Oct. 3
Jacksonville, Fla.	30 20	81 39	Nov. 22	Feb. 5	Dec. 15	Dec. 1	Nov. 30	Dec. 3	Nov. 30	Nov. 16	Nov. 25	Nov. 22	Dec. 16	Dec. 3
Florida Peninsula:														
Cedar Key, Fla.	29 8	83 2		(¹)	(¹)	(¹)	(¹)	(¹)	.....	Dec. 22	(¹)	Dec. 17	Dec. 16	Nov. 25
Key West, Fla.	24 24	81 49							(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
Sanford, Fla.	28 48	81 23											Jan. 10	(¹)

* None observed.

¹ No record.

Dates of the first killing frost at stations of the Signal Service, United States Army, east of the Rocky Mountains, &c.—Continued.

Stations.	Latitude.		Longitude.		WINTER OF—													
	°	'	°	'	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.		
Eastern Gulf States:																		
Atlanta, Ga.....	33 45	84 23								Oct. 19	Nov. 4	Nov. 15	Nov. 4	Nov. 22	Nov. 13	Nov. 6		
Pensacola, Fla.....	30 25	87 13									Dec. 26	Nov. 16	Nov. 25	Nov. 29	Dec. 16	Nov. 19		
Mobile, Ala.....	30 41	88 2									Nov. 2	Dec. 8	Nov. 25	Nov. 15	Dec. 16	Nov. 25		
Montgomery, Ala.....	32 23	86 18									Nov. 22	Nov. 7	Nov. 26	Nov. 15	Nov. 7	Nov. 7		
Vicksburg, Miss.....	32 23	90 53									Nov. 1	Nov. 19	Nov. 4	Nov. 15	Nov. 16	Nov. 6		
New Orleans, La.....	29 53	90 4									Dec. 26	Nov. 19	Nov. 25	Dec. 8	Jan. 2	Dec. 19		
Western Gulf States:																		
Shreveport, La.....	32 30	93 40									Nov. 21	Dec. 7	Nov. 20	Nov. 14	Nov. 15	Nov. 7		
Fort Smith, Ark.....	35 22	94 24										Nov. 4	Nov. 13	Nov. 18	Nov. 3	Nov. 28		
Little Rock, Ark.....	34 45	92 6										Nov. 1	Nov. 13	Nov. 18	Nov. 3	Nov. 18		
Galveston, Tex.....	29 18	94 47									Dec. 25	Nov. 18	(1)	Jan. 9	Jan. 9	Dec. 18		
Indianola, Tex.....	28 32	96 21									Dec. 24	Nov. 18	Nov. 25	Nov. 39	Jan. 9	(1)		
Palestine, Tex.....	31 45	95 40										Nov. 15	Dec. 15	Nov. 13	Nov. 13	Nov. 20		
Rio Grande Valley:																		
Brownsville, Tex.....	25 53	97 26									Dec. 26	Dec. 20	(1)	Jan. 9	Jan. 3	Dec. 25		
Rio Grande City, Tex.....	26 23	96 45									Nov. 27	Dec. 21	(1)	Jan. 2	Jan. 2	Dec. 25		
Ohio Valley and Tennessee:																		
Chattanooga, Tenn.....	35 4	85 15									Oct. 26	Nov. 7	Nov. 16	Nov. 29	Nov. 2	Oct. 24		
Knoxville, Tenn.....	35 56	83 58									Oct. 26	Nov. 7	Nov. 16	Nov. 29	Nov. 2	Oct. 24		
Memphis, Tenn.....	35 9	90 3									Oct. 26	Nov. 7	Nov. 16	Nov. 29	Nov. 2	Oct. 24		
Nashville, Tenn.....	36 10	86 47									Oct. 26	Nov. 7	Nov. 16	Nov. 29	Nov. 2	Oct. 24		
Louisville, Ky.....	38 15	85 45									Oct. 26	Nov. 7	Nov. 16	Nov. 29	Nov. 2	Oct. 24		
Greensboro, Ind.....	39 46	86 53									Oct. 26	Nov. 7	Nov. 16	Nov. 29	Nov. 2	Oct. 24		
Indianapolis, Ind.....	39 46	86 10									Oct. 26	Nov. 7	Nov. 16	Nov. 29	Nov. 2	Oct. 24		
Cincinnati, Ohio.....	39 6	84 36									Oct. 26	Nov. 7	Nov. 16	Nov. 29	Nov. 2	Oct. 24		
Columbus, Ohio.....	39 58	83 0									Oct. 26	Nov. 7	Nov. 16	Nov. 29	Nov. 2	Oct. 24		
Pittsburg, Pa.....	40 32	80 2									Oct. 26	Nov. 7	Nov. 16	Nov. 29	Nov. 2	Oct. 24		
Lower Lakes:																		
Buffalo, N. Y.....	42 53	78 53									Sept. 28	Oct. 28	Oct. 5	Oct. 4	Oct. 1	Oct. 15		
Oswego, N. Y.....	43 29	76 35									Oct. 24	Oct. 24	Oct. 27	Oct. 21	Oct. 1	Oct. 10		
Rochester, N. Y.....	43 8	77 42									Oct. 81	Oct. 24	Oct. 26	Oct. 21	(*)	Oct. 5		
Eric, Pa.....	42 7	80 5									Dec. 4	Oct. 28	Oct. 11	Nov. 4	Oct. 5	Oct. 24		
Cleveland, Ohio.....	41 20	81 42									Nov. 5	Nov. 19	Nov. 16	Nov. 5	Oct. 17	Oct. 20		
Sandusky, Ohio.....	41 25	83 40									Oct. 20	Oct. 25	Nov. 15	Nov. 5	Oct. 27	Oct. 29		
Toledo, Ohio.....	41 40	83 34									Oct. 6	Sept. 25	Oct. 5	Oct. 20	Sept. 9	Oct. 15		
Detroit, Mich.....	42 20	83 3									Sept. 25	Sept. 30	Oct. 10	Oct. 20	Sept. 1	Oct. 15		
Upper Lakes:																		
Alpena, Mich.....	45 5	83 30									Sept. 22	Sept. 22	Oct. 6	Sept. 24	Sept. 10	Sept. 14		
Escanaba, Mich.....	45 48	87 5									Sept. 17	Oct. 5	Oct. 5	Oct. 13	Sept. 28	Oct. 9		
Grand Haven, Mich.....	43 5	86 18									Sept. 21	Sept. 30	Oct. 10	Oct. 24	Sept. 10	Oct. 9		
Marquette, Mich.....	45 47	84 39									Oct. 23	Oct. 7	Oct. 27	Sept. 25	Sept. 29	Nov. 2		
Marquette, Mich.....	46 24	87 24									Oct. 19	Oct. 7	Oct. 27	Sept. 25	Sept. 29	Nov. 2		

		43	0	83	26	Oct. 23	Oct. 11	Oct. 12	Oct. 10	Oct. 5	Nov. 14	Sept. 23	Oct. 24	Oct. 11	Oct. 18	Sept. 26	Oct. 24
Port Huron, Mich.		41	52	87	38	Oct. 23	Oct. 31	Oct. 2	Oct. 4	Oct. 23	Oct. 10	Sept. 20	Oct. 18	Oct. 19	Nov. 13	Sept. 26	Oct. 24
Chicago, Ill.		43	2	87	54	Oct. 7	Oct. 13	Sept. 17	Sept. 3	Sept. 18	Nov. 3	Oct. 24	Oct. 13	Nov. 4	Oct. 10	Oct. 21	Oct. 9
Milwaukee, Wis.		46	48	92	6	Oct. 6	Oct. 13	Oct. 8	Oct. 29	Oct. 30	Sept. 21	Sept. 21	Oct. 10	Oct. 10	Sept. 21	Oct. 1	Oct. 8
Duluth, Minn.		44	54	93	3	Sept. 1	Oct. 12	Oct. 11	Sept. 29	Oct. 10	Oct. 18	Oct. 23	Oct. 12	Oct. 5	Oct. 18	Sept. 30	Oct. 22
Upper Mississippi Valley:		43	49	91	15	Oct. 20	Oct. 12	Oct. 10	Oct. 5	Oct. 11	Oct. 27	Sept. 24	Oct. 12	Oct. 5	Oct. 19	Oct. 1	Oct. 22
La Crosse, Wis.		41	80	90	83	Oct. 22	Oct. 12	Sept. 18	Oct. 5	Oct. 11	Oct. 27	Sept. 24	Oct. 12	Oct. 5	Oct. 19	Oct. 1	Oct. 22
Davenport, Iowa		41	85	93	87	Oct. 20	Oct. 13	Oct. 18	Oct. 7	Oct. 20	Sept. 12	Oct. 20	Oct. 8	Nov. 9	Nov. 13	Oct. 26	Oct. 23
Des Moines, Iowa		43	80	94	4	Oct. 6	Oct. 31	Sept. 18	Oct. 7	Nov. 5	Sept. 12	Oct. 21	Oct. 4	Nov. 13	Nov. 13	Sept. 15	Oct. 23
Keokuk, Iowa		40	21	91	28	Oct. 6	Oct. 31	Sept. 18	Oct. 7	Nov. 5	Sept. 12	Oct. 21	Oct. 4	Nov. 13	Nov. 13	Sept. 15	Oct. 23
Keosauqua, Iowa		37	0	88	10	Oct. 21	Oct. 13	Oct. 2	Oct. 15	Nov. 3	Oct. 19	Nov. 3	Oct. 1	Nov. 13	Nov. 13	Oct. 12	Oct. 24
Springfield, Ill.		23	48	89	29	Oct. 22	Oct. 31	Oct. 31	Oct. 10	Nov. 3	Oct. 18	Sept. 25	Oct. 1	Oct. 20	Nov. 13	Nov. 13	Oct. 21
Saint Louis, Mo.		38	38	90	12	Oct. 22	Oct. 31	Oct. 31	Oct. 10	Nov. 3	Oct. 18	Sept. 25	Oct. 1	Oct. 20	Nov. 13	Nov. 13	Oct. 21
Missouri Valley:		39	19	94	57	Oct. 6	Oct. 12	Oct. 20	Oct. 11	Oct. 4	Sept. 26	Oct. 19	Oct. 17	Nov. 9	Nov. 12	Oct. 26	Oct. 22
Leavenworth, Kans.		41	16	95	56	Sept. 29	Oct. 12	Oct. 11	Oct. 4	Oct. 4	Sept. 26	Oct. 19	Oct. 17	Nov. 9	Nov. 12	Oct. 26	Oct. 22
Omaha, Neb.		41	43	100	89	Sept. 29	Oct. 12	Oct. 11	Oct. 4	Oct. 4	Sept. 26	Oct. 19	Oct. 17	Nov. 9	Nov. 12	Oct. 26	Oct. 22
Barnett, Fort, Dak.		44	21	98	8	Sept. 13	Sept. 13	Sept. 20	Sept. 19	Oct. 4	Sept. 20	Oct. 23	Oct. 3	Oct. 15	Sept. 23	Oct. 2	Oct. 21
Huron, Dak.		42	54	97	28	Sept. 13	Sept. 13	Sept. 20	Sept. 19	Oct. 4	Sept. 20	Oct. 23	Oct. 3	Oct. 15	Sept. 23	Oct. 2	Oct. 21
Yankton, Dak.		46	52	96	44	Sept. 13	Sept. 13	Sept. 20	Sept. 19	Oct. 4	Sept. 20	Oct. 23	Oct. 3	Oct. 15	Sept. 23	Oct. 2	Oct. 21
Extreme Northwest:		48	56	97	11	Sept. 13	Sept. 13	Sept. 20	Sept. 19	Oct. 4	Sept. 20	Oct. 23	Oct. 3	Oct. 15	Sept. 23	Oct. 2	Oct. 21
Albion, Minn.		48	56	97	11	Sept. 13	Sept. 13	Sept. 20	Sept. 19	Oct. 4	Sept. 20	Oct. 23	Oct. 3	Oct. 15	Sept. 23	Oct. 2	Oct. 21
Saint Vincent, Minn.		48	56	97	11	Sept. 13	Sept. 13	Sept. 20	Sept. 19	Oct. 4	Sept. 20	Oct. 23	Oct. 3	Oct. 15	Sept. 23	Oct. 2	Oct. 21
Bismarck, Dak.		48	0	103	56	Sept. 13	Sept. 13	Sept. 20	Sept. 19	Oct. 4	Sept. 20	Oct. 23	Oct. 3	Oct. 15	Sept. 23	Oct. 2	Oct. 21
Burlington, Fort, Dak.		47	57	98	57	Sept. 13	Sept. 13	Sept. 20	Sept. 19	Oct. 4	Sept. 20	Oct. 23	Oct. 3	Oct. 15	Sept. 23	Oct. 2	Oct. 21
Totten, Fort, Dak.		47	57	98	57	Sept. 13	Sept. 13	Sept. 20	Sept. 19	Oct. 4	Sept. 20	Oct. 23	Oct. 3	Oct. 15	Sept. 23	Oct. 2	Oct. 21
Northern Slope:		48	32	100	43	Sept. 24	Sept. 20	Oct. 11	(¹)	(¹)	(¹)	Oct. 12	Sept. 12	Sept. 6	Oct. 2	Sept. 20	Sept. 29
Assiniboine, Fort, Mont.		47	50	110	40	Sept. 24	Sept. 20	Oct. 11	(¹)	(¹)	(¹)	Oct. 12	Sept. 12	Sept. 6	Oct. 2	Sept. 20	Sept. 29
Benton, Fort, Mont.		43	42	107	31	Sept. 24	Sept. 20	Oct. 11	(¹)	(¹)	(¹)	Oct. 12	Sept. 12	Sept. 6	Oct. 2	Sept. 20	Sept. 29
Custer, Fort, Mont.		46	34	112	4	Sept. 24	Sept. 20	Oct. 11	(¹)	(¹)	(¹)	Oct. 12	Sept. 12	Sept. 6	Oct. 2	Sept. 20	Sept. 29
Helena, Mont.		47	12	109	10	Sept. 24	Sept. 20	Oct. 11	(¹)	(¹)	(¹)	Oct. 12	Sept. 12	Sept. 6	Oct. 2	Sept. 20	Sept. 29
Magnolia, Fort, Mont.		48	8	105	10	Sept. 24	Sept. 20	Oct. 11	(¹)	(¹)	(¹)	Oct. 12	Sept. 12	Sept. 6	Oct. 2	Sept. 20	Sept. 29
Poplar River, Mont.		47	31	111	48	Sept. 24	Sept. 20	Oct. 11	(¹)	(¹)	(¹)	Oct. 12	Sept. 12	Sept. 6	Oct. 2	Sept. 20	Sept. 29
Shaw, Fort, Mont.		44	23	103	43	Sept. 24	Sept. 20	Oct. 11	(¹)	(¹)	(¹)	Oct. 12	Sept. 12	Sept. 6	Oct. 2	Sept. 20	Sept. 29
Deadwood, Dak.		41	8	104	48	Sept. 24	Sept. 20	Oct. 11	(¹)	(¹)	(¹)	Oct. 12	Sept. 12	Sept. 6	Oct. 2	Sept. 20	Sept. 29
Cheyenne, Wyo.		41	8	104	48	Sept. 24	Sept. 20	Oct. 11	(¹)	(¹)	(¹)	Oct. 12	Sept. 12	Sept. 6	Oct. 2	Sept. 20	Sept. 29
North Platte, Nebr.		39	45	105	0	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Middle Slope:		38	45	105	0	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Denver, Colo.		38	45	105	0	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Pike's Peak, Colo.		38	4	103	12	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
West Las Animas, Colo.		37	45	100	0	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Dodge City, Kans.		35	30	100	21	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Elliot, Fort, Tex.		34	40	98	23	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Southern Slope:		31	25	100	34	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Sulphur, Ind. T.		31	25	100	34	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Concho, Fort, Tex.		30	38	103	56	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Davis, Fort, Tex.		30	53	102	53	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Stockton, Fort, Tex.		31	47	106	30	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
Southern Plateau:		31	47	106	30	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9
El Paso, Tex.		31	47	106	30	Sept. 29	Oct. 29	Sept. 22	Sept. 30	Oct. 4	Oct. 31	Oct. 10	Oct. 18	Sept. 10	Oct. 8	Sept. 21	Oct. 9

* Every month in the year.

* No record.

* None observed.

APPENDIX 42.

Dates of the last light frost at stations of the Signal Service, United States Army, east of the Rocky Mountains for the winter of 1884-'85.

Stations.	Latitude.	Longitude.	Date.	Stations.	Latitude.	Longitude.	Date.
	° ' "	° ' "	1884-'85.		° ' "	° ' "	1884-'85.
New England:				Lower Lakes—Cont'd:			
Eastport, Me.	44 54	66 59	Apr. 16	Oswego, N. Y.	43 29	76 35	June 3
Portland, Me.	43 39	70 15	(¹)	Rochester, N. Y.	43 8	77 42	May 28
Mount Washington, N. H.	44 16	71 18	(²)	Erie, Pa.	42 7	80 5	(¹)
Boston, Mass.	42 21	71 4	Feb. 28	Cleveland, Ohio.	41 30	81 42	May 2
Block Island, R. I.	41 10	71 36	Mar. 9	Sandusky, Ohio.	41 25	82 40	Apr. 29
New Haven, Conn.	41 18	72 56	May 12	Toledo, Ohio.	41 40	83 34	May 10
New London, Conn.	41 21	72 5	June 10	Detroit, Mich.	42 20	83 3	Apr. 29
Middle Atlantic States:				Upper Lakes:			
Albany, N. Y.	42 39	73 45	May 4	Alpena, Mich.	45 5	83 30	May 13
New York City.	40 43	74 0	(¹)	Escanaba, Mich.	45 48	87 5	June 29
Philadelphia, Pa.	39 57	75 9	Apr. 20	Grand Haven, Mich.	43 8	86 18	June 29
Atlantic City, N. J.	39 22	74 25	Apr. 9	Mackinaw City, Mich.	45 47	84 39	May 12
Barneget City, N. J.	39 46	74 6	(²)	Marquette, Mich.	46 34	87 24	June 8
Cape May, N. J.	38 56	74 58	Apr. 14	Port Huron, Mich.	43 0	83 26	June 23
Sandy Hook, N. J.	40 28	74 0	May 12	Chicago, Ill.	41 52	87 38	May 11
Baltimore, Md.	39 18	76 37	Apr. 9	Milwaukee, Wis.	43 2	87 54	Apr. 29
Washington City.	38 54	77 2	Apr. 20	Duluth, Minn.	46 48	92 6	May 11
Cape Henry, Va.	36 56	76 0	Mar. 30	Upper Mississippi Valley:			
Chincoteague, Va.	37 55	75 23	May 12	Saint Paul, Minn.	44 58	93 3	May 10
Lynchburg, Va.	37 25	79 9	May 11	La Crosse, Wis.	43 49	91 15	June 23
Norfolk, Va.	36 51	76 17	Apr. 14	Davenport, Iowa.	41 30	90 38	May 10
South Atlantic States:				Des Moines, Iowa.	41 35	93 37	June 9
Charlotte, N. C.	35 18	80 51	Apr. 9	Dubuque, Iowa.	42 30	90 44	June 9
Hatteras, N. C.	35 15	75 40	Mar. 24	Keokuk, Iowa.	40 22	91 26	May 10
Kitty Hawk, N. C.	36 0	75 42	Jan. 30	Cairo, Ill.	37 0	89 10	May 10
Macon, Fort, N. C.	34 42	76 40	Apr. 14	Springfield, Ill.	39 48	89 39	May 10
Smithville, N. C.	35 55	78 1	Mar. 23	Saint Louis, Mo.	38 38	90 12	May 8
Wilmington, N. C.	34 14	77 57	Mar. 22	Missouri Valley:			
Charleston, S. C.	32 47	79 56	Mar. 24	Lamar, Mo.	37 32	94 15	May 10
Augusta, Ga.	33 28	81 54	Mar. 17	Leavenworth, Kans.	39 19	94 57	May 10
Savannah, Ga.	32 5	81 5	Mar. 10	Omaha, Nebr.	41 16	95 56	May 10
Jacksonville, Fla.	30 20	81 39	Mar. 19	Bennett, Fort, Dak.	44 43	100 39	Apr. 28
Florida Peninsula:				Huron, Dak.	44 21	98 9	Apr. 28
Cedar Keys, Fla.	29 8	88 2	Feb. 21	Yankton, Dak.	42 54	97 28	June 23
Key West, Fla.	24 34	81 49	(²)	Extreme Northwest:			
Sanford, Fla.	28 48	81 23	Mar. 10	Moorhead, Minn.	46 52	96 44	June 22
Eastern Gulf States:				Saint Vincent, Minn.	48 56	97 14	June 22
Atlanta, Ga.	33 45	84 23	Apr. 14	Bismarck, Dak.	46 47	100 28	June 13
Pennacola, Fla.	30 25	87 13	Apr. 5	Buford, Fort, Dak.	48 0	103 56	June 8
Mobile, Ala.	30 41	88 2	Mar. 10	Totten, Fort, Dak.	47 57	98 57	May 16
Montgomery, Ala.	32 23	86 18	Mar. 16	Northern Slope:			
Vicksburg, Miss.	32 22	90 53	Mar. 29	Assinaboine, Fort, Mont.	48 32	109 42	May 10
New Orleans, La.	29 58	90 4	Mar. 10	Benton, Fort, Mont.	47 50	110 40	Apr. 29
Western Gulf States:				Custer, Fort, Mont.	45 42	107 34	(¹)
Shreveport, La.	32 30	93 40	Mar. 29	Holena, Mont.	46 34	112 4	June 8
Fort Smith, Ark.	35 22	94 24	Apr. 13	Maginnis, Fort, Mont.	47 12	109 10	June 15
Little Rock, Ark.	34 45	92 6	Mar. 16	Poplar River, Mont.	48 8	105 10	May 24
Galveston, Tex.	29 18	94 47	Feb. 12	Shaw, Fort, Mont.	47 31	111 48	June 8
Indianola, Tex.	28 32	96 31	Feb. 16	Deadwood, Dak.	44 23	103 43	June 15
Palestine, Tex.	31 45	95 40	Mar. 29	Cheyenne, Wyo.	41 8	104 48	June 15
Rio Grande Valley:				North Platte, Nebr.	41 8	100 45	June 15
Brownsville, Tex.	25 53	97 26	Jan. 18	Middle Slope:			
Rio Grande City, Tex.	26 23	98 48	Jan. 26	Denver, Colo.	39 45	105 0	Apr. 30
Ohio Valley and Tennessee:				Pike's Peak, Colo.	38 50	105 2	(²)
Chattanooga, Tenn.	35 4	85 15	May 11	West Las Animas, Colo.	38 4	103 12	Apr. 15
Knoxville, Tenn.	35 56	83 58	May 11	Dodge City, Kans.	37 45	100 0	May 12
Memphis, Tenn.	35 9	90 8	May 10	Elliott, Fort, Tex.	35 30	100 21	Mar. 22
Nashville, Tenn.	36 10	86 47	May 10	Southern Slope:			
Louisville, Ky.	38 15	85 45	Apr. 13	Sill, Fort, Ind. T.	34 40	98 23	Mar. 9
Greencastle, Ind.	39 40	86 53	May 8	Concho, Fort, Tex.	31 25	100 34	Mar. 2
Indianapolis, Ind.	39 48	86 10	May 10	Davis, Fort, Tex.	30 28	103 56	Apr. 23
Cincinnati, Ohio.	39 6	84 30	Apr. 29	Stockton, Fort, Tex.	30 53	102 53	Feb. 12
Columbus, Ohio.	39 58	83 0	May 8	Southern Plateau:			
Pittsburg, Pa.	40 32	80 2	May 8	El Paso, Tex.	31 47	106 30	Apr. 23
Lower Lakes:							
Buffalo, N. Y.	42 58	78 53	May 3				

¹No reliable record.²Frost every month in the year.³No frost observed.

APPENDIX 43.

Dates of the last killing frost at stations of the Signal Service, United States Army, east of the Rocky Mountains for each winter from 1873-74 to 1884-85.

Stations.	Latitude.	Longitude.	WINTER OF—											
			1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
New England:														
Eastport, Me.....	44 54	66 59	May 2	June 19	Apr. 30	Apr. 8	Apr. 10	Apr. 21	May 1	May 4	Apr. 14	Apr. 30	Apr. 23	May 4
Portland, Me.....	43 30	70 15	Apr. 30	Apr. 22	Apr. 9	Apr. 4	Mar. 26	Apr. 20	Apr. 13	Apr. 15	Apr. 12	Mar. 24	Apr. 22	May 11
Mount Washington, N. H.....	44 16	71 18	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
Boston, Mass.....	42 31	71 4	May 3	Apr. 22	Apr. 9	Apr. 19	Mar. 26	Apr. 19	Apr. 13	Apr. 23	May 23	Apr. 30	Apr. 22	May 15
Block Island, R. I.....	41 10	71 36	Apr. 30	Apr. 23	May 1	Apr. 13	Mar. 26	May 24	Mar. 8	Apr. 23	May 16	Apr. 30	May 6	Mar. 19
New Haven, Conn.....	41 18	72 56	Apr. 18	Apr. 8	May 1	May 5	Mar. 10	May 24	Apr. 12	Apr. 7	May 8	Apr. 20	May 6	Apr. 4
New London, Conn.....	41 21	72 5												
Middle Atlantic States:														
Albany, N. Y.....	42 30	73 45	May 7	May 1	May 1	May 3	May 14	Apr. 20	Apr. 13	Apr. 7	Apr. 12	Apr. 8	Apr. 1	Apr. 10
New York City.....	40 43	74 0	May 20	Apr. 25	Apr. 10	Apr. 8	Mar. 26	Apr. 6	Apr. 12	Apr. 4	Apr. 12	Apr. 2	Mar. 31	Apr. 15
Philadelphia, Pa.....	39 57	75 9	Apr. 29	Apr. 22	Apr. 10	Apr. 3	Mar. 26	Apr. 6	Apr. 13	Apr. 7	Apr. 12	Apr. 1	Mar. 31	Apr. 14
Atlantic City, N. J.....	39 22	74 25	Apr. 29	Apr. 25	Apr. 20	Apr. 11	Mar. 25	Apr. 20	Apr. 12	Apr. 7	Apr. 15	Mar. 31	Apr. 7	Mar. 23
Barnegat City, N. J.....	39 46	74 6	Apr. 13	Apr. 25	Apr. 9	Apr. 8	May 14	Apr. 13	Apr. 12	Mar. 8	Jan. 15	Apr. 30	Mar. 31	Apr. 14
Cape May, N. J.....	38 56	74 68	Apr. 13	Apr. 31	Apr. 9	Apr. 3	Mar. 26	Apr. 6	Apr. 13	Mar. 16	May 3	Mar. 9	Apr. 2	Apr. 14
Sandy Hook, N. J.....	40 23	74 0	Apr. 30	Apr. 23	Apr. 9	Mar. 29	Mar. 25	Apr. 6	Apr. 11	Apr. 7	Feb. 27	Apr. 2	Mar. 31	Mar. 30
Delaware Breakwater, Del.....	38 45	75 10												
Baltimore, Md.....	39 18	76 87	Apr. 13	Apr. 22	Apr. 2	Apr. 3	Mar. 26	Apr. 5	Apr. 12	Apr. 21	May 8	Apr. 25	Mar. 30	Mar. 16
Washington City.....	38 54	77 2	Apr. 29	Apr. 18	Apr. 26	Mar. 31	Mar. 26	Mar. 25	Apr. 12	Apr. 7	Apr. 12	Mar. 1	Mar. 31	Mar. 14
Cape Henry, Va.....	36 56	76 0	Mar. 25	Apr. 19	Apr. 23	Mar. 20	Mar. 25	Mar. 6	Mar. 25	Apr. 29	Feb. 15	Mar. 25	Mar. 5	Feb. 24
Chillicothe, Va.....	37 55	75 28												
Lynchburg, Va.....	37 25	79 9	Apr. 13	Apr. 19	Apr. 13	Apr. 15	Mar. 26	Apr. 4	Apr. 12	Apr. 7	Apr. 18	Apr. 2	Mar. 31	Apr. 11
Norfolk, Va.....	36 51	76 17	Apr. 13	Apr. 19	Mar. 23	Mar. 20	Mar. 21	Mar. 6	Apr. 12	Apr. 7	May 8	Apr. 2	Mar. 10	Mar. 30
South Atlantic States:														
Charlotte, N. C.....	35 13	80 51						May 3	Apr. 13	Apr. 15	Mar. 25	Mar. 23	Mar. 10	Apr. 14
Richmond, N. C.....	36 15	79 40								Apr. 5	Jan. 5	Mar. 23	Mar. 8	Feb. 21
Kitty Hawk, N. C.....	36 0	75 42					Jan. 18	Mar. 6	Mar. 25	Apr. 7	Feb. 24	Mar. 23	Mar. 5	Feb. 28
Roanoke, N. C.....	34 42	78 0												
Smithville, N. C.....	33 55	78 1												
Winnington, N. C.....	34 14	77 57	Mar. 14	Apr. 19	Mar. 22	Mar. 11	Feb. 12	Mar. 19	Feb. 20	Apr. 8	Jan. 23	Mar. 23	Mar. 4	Mar. 24
Charleston, S. C.....	32 47	79 56	Jan. 17	Feb. 8	Mar. 4	Mar. 11	Feb. 12	Apr. 4	Mar. 30	Apr. 2	Jan. 4	Mar. 21	Feb. 29	Mar. 11
Charleston, S. C.....	33 23	81 54	Feb. 11	Feb. 21	Mar. 19	Mar. 11	Feb. 12	Mar. 2	Apr. 12	Jan. 2	Feb. 6	Jan. 23	Feb. 1	Apr. 14
Savannah, Ga.....	32 5	81 5	Feb. 5	Feb. 2	Mar. 22	Mar. 10	Feb. 12	Feb. 10	Dec. 18	Jan. 26	Jan. 4	Jan. 23	Mar. 29	Apr. 13
Jacksonville, Fla.....	30 20	81 39								Feb. 4	Feb. 6	Mar. 23	Jan. 22	Mar. 17
Florida Peninsula:														
Cedar Keys, Fla.....	29 8	83 2								Dec. 22	Jan. 3	Jan. 12	Jan. 22	Feb. 11

* Station closed April 1, 1885.

* No killing frost reported.

† Frost every month in the year.

Dates of the last killing frost at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	Latitude.	Longitude.	WINTER OF—											
			1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
Florida Peninsula—Continued:														
Key West, Fla.	24 24	81 49	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
Sanford, Fla.	28 48	81 23												
Eastern Gulf States:														
Atlanta, Ga.	33 45	84 23						Mar. 18	Feb. 15	Apr. 5	Feb. 2	Apr. 8	Jan. 22	Mar. 24
Pensacola, Fla.	30 25	87 13						Jan. 10	Dec. 27	Mar. 2	Feb. 5	Jan. 20	Mar. 10	Mar. 23
Mobile, Ala.	30 41	88 2						Jan. 16	Dec. 27	Apr. 2	Feb. 2	Mar. 5	Feb. 29	Mar. 23
Montgomery, Ala.	32 21	86 18						Feb. 11	Dec. 18	Apr. 6	Mar. 2	Mar. 13	Mar. 11	Mar. 11
Vicksburg, Miss.	32 22	90 53						Feb. 19	Feb. 14	Apr. 2	Feb. 1	Feb. 10	Feb. 29	Mar. 9
New Orleans, La.	29 58	90 4			(¹)			Jan. 10	Dec. 26	Jan. 12	Nov. 26	Jan. 23	Jan. 28	Jan. 18
Western Gulf States:														
Shreveport, La.	32 30	93 40						Jan. 20	Feb. 4	Feb. 2	Feb. 23	Feb. 19	Feb. 29	Mar. 23
Fort Smith, Ark.	35 22	94 34						Jan. 9	Dec. 17	Apr. 14	Feb. 22	Mar. 27	Mar. 9	Mar. 29
Little Rock, Ark.	34 45	92 6						Jan. 9	Dec. 26	Feb. 22	Feb. 18	Feb. 15	Feb. 15	Feb. 11
Galveston, Tex.	29 18	94 47			(¹)			Jan. 9	Mar. 15	Apr. 14	Dec. 16	Feb. 18	Feb. 15	Feb. 14
Indianapolis, Ind.	39 32	86 31			(¹)			Jan. 9	Dec. 26	Jan. 11	(¹)	Feb. 18	Mar. 9	Mar. 22
Palestine, Tex.	31 45	95 40						Jan. 9	Dec. 26	Jan. 11	(¹)	Feb. 18	Mar. 9	Mar. 22
Rio Grande Valley:														
Brownsville, Tex.	25 53	97 20						Jan. 6	Dec. 15	Jan. 10	Dec. 16	Feb. 18	Jan. 25	Feb. 14
Rio Grande City, Tex.	26 23	98 48						Jan. 6	Dec. 15	Jan. 10	Dec. 16	Feb. 18	Mar. 1	Feb. 14
Ohio Valley and Tennessee:														
Chattanooga, Tenn.	35 4	85 15						Apr. 6	Jan. 23	Apr. 5	Feb. 25	Mar. 22	Mar. 10	Mar. 24
Knoxville, Tenn.	35 50	83 68						Apr. 12	Apr. 13	Apr. 10	Mar. 25	Apr. 25	Apr. 11	Apr. 14
Memphis, Tenn.	35 0	90 3						Apr. 5	Mar. 17	Apr. 1	Mar. 10	Apr. 10	Apr. 10	Apr. 4
Nashville, Tenn.	36 10	86 47						Apr. 12	Apr. 12	Apr. 5	Feb. 2	Mar. 3	Mar. 10	Apr. 4
Louisville, Ky.	38 15	85 45						Apr. 8	Mar. 17	Apr. 14	Apr. 11	Apr. 8	Mar. 10	Apr. 4
Greencastle, Ind.	39 40	86 10						Apr. 6	Apr. 7	Apr. 14	Apr. 12	Apr. 24	Apr. 6	Apr. 29
Indianapolis, Ind.	39 46	86 10						Apr. 21	Apr. 12	Apr. 7	Apr. 16	Apr. 22	Apr. 29	Apr. 29
Cincinnati, Ohio	39 58	84 30						Apr. 12	Apr. 12	Apr. 7	Apr. 16	Apr. 22	Apr. 9	Apr. 29
Columbus, Ohio	39 58	83 0						May 3	May 1	Apr. 15	May 3	May 17	Apr. 7	Apr. 29
Pittsburg, Pa.	40 32	80 2						May 3	May 1	Apr. 15	May 3	May 17	Apr. 7	Apr. 29
Lower Lakes:														
Buffalo, N. Y.	42 53	78 53						May 8	Mar. 31	Apr. 15	Apr. 25	Apr. 30	Apr. 80	May 18
Oswego, N. Y.	42 59	76 36						May 12	May 1	Apr. 15	Apr. 25	Apr. 30	Apr. 80	May 18
Rochester, N. Y.	43 8	77 42						May 12	May 1	Apr. 15	Apr. 25	Apr. 30	Apr. 80	May 18
Erie, Pa.	42 7	80 5						May 12	May 1	Apr. 15	Apr. 25	Apr. 30	Apr. 80	May 18
Cleveland, Ohio	41 30	81 42						May 12	May 1	Apr. 15	Apr. 25	Apr. 30	Apr. 80	May 18
Sandusky, Ohio	41 25	82 40						May 12	May 1	Apr. 15	Apr. 25	Apr. 30	Apr. 80	May 18
Toledo, Ohio	41 40	83 31						May 12	May 1	Apr. 15	Apr. 25	Apr. 30	Apr. 80	May 18
Detroit, Mich.	42 0	83 3						May 12	May 1	Apr. 15	Apr. 25	Apr. 30	Apr. 80	May 18
Upper Lakes:														
Alpena, Mich.	45 5	83 30						May 7	May 1	Apr. 29	May 28	May 8	May 8	June 29

Esconaba, Mich.	45 46	87 5	May 18	May 6	May 4	May 3	May 15	May 8	80	May 6	May 16	Apr. 24	May 3	June 29
Grand Haven, Mich.	43 5	86 18	Apr. 29	May 2	May 1	Apr. 5	May 11	May 7	8	Apr. 16	Mar. 2	Apr. 11	Apr. 21	June 10
Maclean City, Mich.	45 47	84 39	May 6	May 16	May 4	May 30	May 18	June 5	30	June 6	June 11	Apr. 30	Apr. 28	May 28
Marquette, Mich.	46 54	87 26	May 3	May 3	May 30	Apr. 30	May 12	Apr. 8	13	Apr. 7	May 25	Apr. 18	May 29	May 11
Port Huron, Mich.	43 0	82 38	Apr. 24	May 3	Apr. 30	May 8	May 29	May 2	30	Apr. 14	May 1	May 21	Apr. 2	May 10
Chicago, Ill.	41 53	87 54	Apr. 23	May 2	May 6	May 2	May 12	May 7	7	Apr. 3	May 1	May 11	Apr. 20	May 11
Milwaukee, Wis.	46 43	92 6	Apr. 23	May 16	May 6	May 2	May 12	May 7	7	Apr. 3	May 1	May 11	Apr. 29	June 8
Duluth, Minn.	43 3	89 32	Apr. 23	May 16	May 6	May 2	May 12	May 7	7	Apr. 3	May 1	May 11	Apr. 29	June 8
Upper Mississippi Valley:														
Saint Paul, Minn.	41 58	93 3	Apr. 26	May 5	May 4	Apr. 30	Apr. 6	Apr. 17	May 21	Apr. 16	May 23	Apr. 19	Apr. 21	May 7
La Crosse, Wis.	43 40	91 15	Apr. 24	May 1	May 18	May 1	May 18	May 9	17	Apr. 14	May 23	May 23	Apr. 21	May 11
Davenport, Iowa	41 30	90 38	Apr. 28	May 6	May 1	Apr. 30	May 28	May 11	11	Apr. 14	May 23	May 23	Apr. 21	May 9
Des Moines, Iowa	41 35	90 47	Apr. 28	May 6	May 1	Apr. 30	May 28	May 11	11	Apr. 14	May 23	May 23	Apr. 21	May 9
Dubuque, Iowa	42 30	93 44	Apr. 17	May 2	May 1	May 1	May 20	Apr. 18	19	Apr. 16	May 23	May 23	Apr. 21	May 10
Kokomo, Iowa	40 22	91 26	Apr. 23	May 2	Apr. 2	Apr. 3	May 20	Apr. 18	17	Apr. 16	May 23	May 23	Apr. 21	May 10
Caru, Ill.	37 0	89 10	Mar. 12	Apr. 17	Mar. 29	Apr. 30	Feb. 28	Apr. 8	17	Apr. 14	May 10	Mar. 23	Apr. 10	May 8
Springfield, Ill.	39 48	90 39	Apr. 29	May 3	Mar. 30	Apr. 30	Feb. 27	Mar. 13	3	Apr. 14	Mar. 11	Mar. 23	Mar. 30	Apr. 10
St. Louis, Mo.	38 38	89 12	Apr. 29	May 3	Mar. 30	Apr. 30	Feb. 27	Mar. 13	3	Apr. 14	Mar. 11	Mar. 23	Mar. 30	Apr. 10
Missouri Valley:														
Leavenworth, Kans.	37 33	94 15	Apr. 17	May 1	Apr. 5	Apr. 2	Apr. 4	Mar. 17	20	Apr. 13	Mar. 10	Apr. 7	Apr. 8	May 8
Omaha, Neb.	39 19	94 57	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 12
Bennett, Fort, Dak.	44 43	100 36	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 12
Huron, Dak.	44 21	98 0	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 12
Yankton, Dak.	42 54	97 28	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 12
Extreme Northwest:														
Moorhead, Minn.	46 52	96 44	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 12
Saint Vincent, Minn.	48 56	97 14	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 12
Bismarck, Dak.	46 47	100 38	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 12
Buford, Fort, Dak.	48 0	108 56	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 12
Totten, Fort, Dak.	47 57	98 57	Apr. 23	May 4	Apr. 14	Apr. 2	Mar. 28	Apr. 4	7	Apr. 1	Apr. 12	Apr. 1	Apr. 10	May 12
Northern Slope:														
Assiniboine, Fort, Mont.	48 32	109 42	Apr. 22	May 28	June 1	(¹)	(¹)	(¹)	(¹)	May 23	May 10	June 1	May 4	May 8
Benton, Fort, Mont.	47 50	110 40	Apr. 22	May 28	June 1	(¹)	(¹)	(¹)	(¹)	May 23	May 10	June 1	May 4	May 8
Custer, Fort, Mont.	45 42	107 84	Apr. 22	May 28	June 1	(¹)	(¹)	(¹)	(¹)	May 23	May 10	June 1	May 4	May 8
Helena, Mont.	46 84	112 4	Apr. 22	May 28	June 1	(¹)	(¹)	(¹)	(¹)	May 23	May 10	June 1	May 4	May 8
Maginnis, Fort, Mont.	47 12	109 10	Apr. 22	May 28	June 1	(¹)	(¹)	(¹)	(¹)	May 23	May 10	June 1	May 4	May 8
Poplar River, Mont.	48 8	105 10	Apr. 22	May 28	June 1	(¹)	(¹)	(¹)	(¹)	May 23	May 10	June 1	May 4	May 8
Shaw, Fort, Mont.	47 31	111 48	Apr. 22	May 28	June 1	(¹)	(¹)	(¹)	(¹)	May 23	May 10	June 1	May 4	May 8
Deadwood, Dak.	44 28	103 43	Apr. 15	May 1	Apr. 14	May 7	May 10	Apr. 4	30	Apr. 13	May 20	May 11	May 1	May 10
Cheyenne, Wyo.	41 8	100 45	Apr. 15	May 1	Apr. 14	May 7	May 10	Apr. 4	30	Apr. 13	May 20	May 11	May 1	May 10
North Platte, Nebr.	41 8	100 45	Apr. 15	May 1	Apr. 14	May 7	May 10	Apr. 4	30	Apr. 13	May 20	May 11	May 1	May 10
Middle Slope:														
Denver, Colo.	39 45	105 0	May 4	May 8	May 6	May 6	May 10	Apr. 17	May 11	May 29	Apr. 18	May 28	May 5	May 11
Pike's Peak, Colo.	38 60	105 2	May 4	May 8	May 6	May 6	May 10	Apr. 17	May 11	May 29	Apr. 18	May 28	May 5	May 11
West Las Animas, Colo.	38 4	103 12	Apr. 26	Apr. 26	Apr. 14	Apr. 30	Apr. 4	Apr. 11	Apr. 26	Apr. 14	Apr. 15	Apr. 25	May 6	Apr. 25
Dodge City, Kans.	37 45	100 0	Apr. 26	Apr. 26	Apr. 14	Apr. 30	Apr. 4	Apr. 11	Apr. 26	Apr. 14	Apr. 15	Apr. 25	May 6	Apr. 25
Elliot, Fort, Tex.	35 30	100 21	Apr. 26	Apr. 26	Apr. 14	Apr. 30	Apr. 4	Apr. 11	Apr. 26	Apr. 14	Apr. 15	Apr. 25	May 6	Apr. 25
Southern Slope:														
Sul, Fort, Ind. T.	34 40	98 23	Mar. 25	Mar. 4	Apr. 4	Apr. 4	Apr. 4	Apr. 4	Apr. 4	Apr. 13	Feb. 5	Mar. 20	(¹)	Mar. 23

* Frost every month in the year.

* No record.

* No killing frost reported.

Dates of the last killing frost at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	Latitude.	Longitude.	WINTER OF—											
			1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
Southern Slope—Continued:														
Concho, Fort, Tex.....	31 25	100 54	.....	.....	.....	.....	Mar. 4	Mar. 18	Apr. 9	Mar. 10	Mar. 9	Mar. 19	Mar. 14	Mar. 29
David, Fort, Tex.....	30 58	102 56	.....	.....	.....	.....	Apr. 2	Apr. 8	Apr. 9	Mar. 21	Apr. 16	Apr. 6	Apr. 22	Mar. 29
Stockton, Fort, Tex.....	30 53	102 53	.....	.....	.....	.....	Mar. 4	Mar. 19	Mar. 19	Apr. 14	Mar. 8	Apr. 15	Apr. 21	Feb. 11
Southern Plateau:														
El Paso, Tex.....	31 47	100 30	.....	.....	.....	.....	.....	Apr. 10	Mar. 16	Apr. 14	Apr. 23	Apr. 16	Mar. 28	Mar. 7

APPENDIX 44.

Dates of the first snowfall at stations of the Signal Service, United States Army, east of the Rocky Mountains for the winter of 1884-'85.

Stations.	Latitude.	Longitude.	Date.	Stations.	Latitude.	Longitude.	Date.
o /	o /	1884-'85.		o /	o /	1884-'85.	
New England:				Lower Lakes:			
Eastport, Me.	44 54	66 50	Oct. 14	Buffalo, N. Y.	42 53	78 53	Oct. 23
Portland, Me.	43 39	70 15	Oct. 16	Oswego, N. Y.	42 29	76 35	Oct. 23
Mount Washington, N. H.	44 16	71 18	July 21	Rochester, N. Y.	43 8	77 42	Oct. 23
Boston, Mass.	42 21	71 4	Oct. 31	Erie, Pa.	42 7	80 5	Oct. 23
Block Island, R. I.	41 10	71 36	Dec. 12	Cleveland, Ohio.	41 30	81 42	Oct. 23
New Haven, Conn.	41 18	72 56	Nov. 18	Sandusky, Ohio.	41 25	82 40	Oct. 23
New London, Conn.	41 21	72 5	Nov. 19	Toledo, Ohio.	41 40	83 34	Oct. 23
Middle Atlantic States:				Detroit, Mich.	42 20	83 3	Oct. 23
Albany, N. Y.	42 39	73 45	Oct. 25	Upper Lakes:			
New York City.	40 43	74 0	Nov. 18	Alpena, Mich.	45 5	83 30	Oct. 23
Philadelphia, Pa.	39 57	75 9	Nov. 18	Escanaba, Mich.	45 48	87 5	Oct. 22
Atlantic City, N. J.	39 22	74 25	Dec. 18	Grand Haven, Mich.	43 5	86 18	Oct. 22
Barnegat City, N. J.	39 46	74 6	Dec. 18	Mackinaw City, Mich.	45 47	84 39	Oct. 22
Cape May, N. J.	38 56	74 58	Dec. 18	Marquette, Mich.	45 34	87 24	Oct. 22
Sandy Hook, N. J.	40 28	74 0	Dec. 18	Port Huron, Mich.	43 0	82 26	Oct. 23
Del. Breakwater.				Chicago, Ill.	41 52	87 38	Oct. 23
Del.	38 48	75 10	Dec. 18	Milwaukee, Wis.	43 2	87 54	Oct. 24
Baltimore, Md.	39 18	76 37	Nov. 3	Duluth, Minn.	46 48	92 6	Oct. 20
Washington City.	38 54	77 2	Nov. 6	Upper Mississippi Valley:			
Cape Henry, Va.	36 56	76 0	Dec. 18	Saint Paul, Minn.	44 58	93 3	Oct. 22
Chincoteague, Va.	37 55	75 28	Dec. 18	La Crosse, Wis.	43 49	91 15	Oct. 22
Lynchburg, Va.	37 25	79 9	Nov. 30	Davenport, Iowa.	41 30	90 38	Nov. 4
Norfolk, Va.	36 51	76 17	Dec. 18	Des Moines, Iowa.	41 35	93 37	Nov. 22
South Atlantic States:				Dubuque, Iowa.	42 30	90 44	Oct. 22
Charlotte, N. C.	35 13	80 51	Mar. 17	Keokuk, Iowa.	40 22	91 26	Nov. 17
Hatteras, N. C.	35 15	75 40	Dec. 19	Cairo, Ill.	37 0	89 10	Nov. 27
Kitty Hawk, N. C.	36 0	75 42	Dec. 19	Springfield, Ill.	39 48	89 39	Nov. 17
Macon, Fort, N. C.	34 42	76 40	Mar. 18	Saint Louis, Mo.	38 38	90 12	Nov. 18
Smithville, N. C.	33 55	78 1	(¹)	Missouri Valley:			
Wilmington, N. C.	34 14	77 57	(¹)	Leavenworth, Kans.	39 19	94 57	Nov. 17
Charleston, S. C.	32 47	79 56	(¹)	Omaha, Nebr.	41 16	95 56	Nov. 18
Augusta, Ga.	33 28	81 54	Feb. 12	Bennett, Fort, Dak.	44 48	100 39	Oct. 20
Savannah, Ga.	32 5	81 5	(¹)	Huron, Dak.	44 21	98 9	Oct. 20
Jacksonville, Fla.	30 20	81 39	(¹)	Yankton, Dak.	42 54	97 28	Oct. 7
Florida Peninsula:				Extreme Northwest:			
Cedar Keys, Fla.	29 3	83 2	(¹)	Moorhead, Minn.	46 52	96 44	Oct. 21
Key West, Fla.	24 34	81 49	(¹)	Saint Vincent, Minn.	48 56	97 14	Oct. 21
Saunder, Fla.	28 48	81 23	(¹)	Bismarck, Dak.	46 47	100 38	Nov. 1
Eastern Gulf States:				Buford, Fort, Dak.	48 0	103 56	Oct. 21
Atlanta, Ga.	33 45	84 23	Dec. 18	Totten, Fort, Dak.	47 57	98 57	Oct. 26
Pensacola, Fla.	30 25	87 13	(¹)	Northern Slope:			
Mobile, Ala.	30 41	88 2	(¹)	Assinaboine, Fort, Mont.	48 32	109 42	Oct. 3
Montgomery, Ala.	32 23	86 18	Feb. 12	Benton, Fort, Mont.	47 50	110 40	Oct. 2
Vicksburg, Miss.	33 22	90 53	Dec. 18	Custer, Fort, Mont.	45 42	107 34	Oct. 19
New Orleans, La.	29 58	90 4	(¹)	Helena, Mont.	46 34	112 4	Oct. 1
Western Gulf States:				Maginnis, Fort, Mont.	47 12	109 10	Sept. 6
Shreveport, La.	32 30	93 40	Jan. 16	Poplar River, Mont.	48 8	105 10	Oct. 20
Fort Smith, Ark.	35 22	94 24	Dec. 18	Shaw, Fort, Mont.	47 81	111 48	Oct. 2
Little Rock, Ark.	34 45	92 6	Jan. 16	Deadwood, Dak.	44 22	103 43	Sept. 29
Galveston, Tex.	29 18	94 47	(¹)	Cheyenne, Wyo.	41 8	104 48	Oct. 26
Indianola, Tex.	28 22	96 31	(¹)	North Platte, Nebr.	41 8	100 45	Oct. 7
Palcatine, Tex.	31 45	95 40	Jan. 16	Middle Slope:			
Rio Grande Valley:				Denver, Colo.	39 45	105 0	Oct. 7
Brownsville, Tex.	28 53	97 26	(¹)	Pike's Peak, Colo.	38 50	105 2	(¹)
Rio Grande City, Tex.	26 23	98 48	(¹)	West Las Animas, Colo.	38 4	103 12	Nov. 17
Ohio Valley and Tennessee:				Dodge City, Kans.	37 45	100 0	Nov. 17
Chattanooga, Tenn.	35 4	85 15	Dec. 18	Elliott, Fort, Tex.	35 30	100 21	Dec. 10
Knoxville, Tenn.	36 56	83 58	Dec. 18	Southern Slope:			
Memphis, Tenn.	35 9	90 8	Dec. 17	Sill, Fort, Ind. T.	34 40	98 23	Dec. 11
Nashville, Tenn.	36 10	86 47	Nov. 28	Concho, Fort, Tex.	31 25	100 34	Jan. 15
Louisville, Ky.	38 15	85 45	Nov. 18	Davis, Fort, Tex.	30 38	103 56	Dec. 11
Greencastle, Ind.	39 40	86 53	Nov. 23	Stockton, Fort, Tex.	30 53	102 53	Jan. 4
Indianapolis, Ind.	39 46	86 10	Nov. 5	Southern Plateau:			
Cincinnati, Ohio.	39 6	84 30	Nov. 18	El Paso, Tex.	31 47	106 30	Dec. 11
Columbus, Ohio.	39 58	88 0	Oct. 23				
Pittsburg, Pa.	40 32	80 2	Oct. 23				

¹ No snow observed.² Snow every month in the year.

APPENDIX 45.

Dates of the last snowfall at stations of the Signal Service, United States Army, east of the Rocky Mountains for the winter of 1884-'85.

Stations.	Latitude.	Longitude.	Date.	Stations.	Latitude.	Longitude.	Date.
New England:	° /	° /	1884-'85	Lower Lakes—Cont'd:	° /	° /	1884-'85
Eastport, Me.	44 51	66 59	May 2	Oswego, N. Y.	43 29	76 35	May 10
Portland, Me.	43 39	70 15	May 2	Rochester, N. Y.	43 8	77 43	May 10
Mount Washington, N. H.	44 16	71 18	(¹)	Erie, Pa.	42 7	80 5	May 9
Boston, Mass.	42 21	71 4	Apr. 2	Cleveland, Ohio.	41 30	81 42	May 9
Block Island, R. I.	41 10	71 36	Mar. 29	Sandusky, Ohio.	41 25	82 40	May 9
New Haven, Conn.	41 18	72 56	Apr. 11	Toledo, Ohio.	41 40	83 34	May 9
New London, Conn.	41 21	72 5	Mar. 29	Detroit, Mich.	42 20	83 3	Apr. 14
Middle Atlantic States:				Upper Lakes:			
Albany, N. Y.	42 30	73 45	May 1	Alpena, Mich.	45 5	83 30	May 10
New York City.	40 43	74 0	Apr. 29	Escanaba, Mich.	45 48	87 5	May 10
Philadelphia, Pa.	39 57	75 9	Apr. 15	Grand Haven, Mich.	43 5	86 18	May 10
Atlantic City, N. J.	39 22	74 25	Apr. 11	Mackinaw City, Mich.	45 47	84 39	May 8
Barnegat City, N. J.	39 40	74 6	Apr. 29	Marquette, Mich.	46 34	87 24	May 10
Cape May, N. J.	38 56	74 68	Mar. 22	Port Huron, Mich.	43 0	82 26	May 9
Sandy Hook, N. J.	40 28	74 0	Apr. 11	Chicago, Ill.	41 52	87 38	Apr. 14
Baltimore, Md.	39 18	76 37	Apr. 11	Milwaukee, Wis.	43 2	87 54	Apr. 14
Washington City.	38 54	77 2	Apr. 11	Duluth, Minn.	46 48	92 6	May 7
Cape Henry, Va.	36 56	76 0	Apr. 10	Upper Mississippi Valley:			
Chincoteague, Va.	37 55	75 23	Mar. 22	•			
Lynchburg, Va.	37 25	79 9	Apr. 13	Saint Paul, Minn.	44 58	93 3	May 8
Norfolk, Va.	36 51	76 17	Apr. 13	La Crosse, Wis.	43 49	91 15	May 9
South Atlantic States:				Davenport, Iowa.	41 30	90 38	Apr. 12
Charlotte, N. C.	35 19	80 51	Mar. 23	Des Moines, Iowa.	41 35	93 37	Apr. 5
Hatteras, N. C.	35 15	75 40	Mar. 28	Dubuque, Iowa.	42 30	93 44	May 7
Kitty Hawk, N. C.	36 0	75 42	Mar. 23	Keokuk, Iowa.	40 22	91 28	Apr. 9
Macon, Port. N. C.	34 42	70 40	Mar. 23	Calro, Ill.	37 0	80 10	Mar. 9
Smithville, N. C.	33 53	78 1	(¹)	Springfield, Ill.	39 48	89 39	Apr. 9
Wilmington, N. C.	34 14	77 57	Mar. 23	Saint Louis, Mo.	38 38	90 12	Apr. 9
Charleston, S. C.	32 47	79 56	(¹)	Missouri Valley:			
Augusta, Ga.	32 28	81 54	Mar. 23	Lamar, Mo.	37 32	94 15	May 7
Savannah, Ga.	32 5	81 5	(¹)	Leavenworth, Kans.	39 19	94 57	Mar. 29
Jacksonville, Fla.	30 20	81 39	(¹)	Omaha, Nebr.	41 16	93 56	Apr. 9
Florida Peninsula:				Bennett, Fort, Dak.	44 43	100 30	May 6
Cedar Keys, Fla.	29 8	83 2	(¹)	Huron, Dak.	44 21	98 9	May 6
Key West, Fla.	24 34	81 49	(¹)	Yankton, Dak.	42 54	97 28	May 7
Saunder, Fla.	28 48	81 23	(¹)	Extreme Northwest:			
Eastern Gulf States:				Moorhead, Minn.	46 52	96 44	May 8
Atlanta, Ga.	33 45	84 23	Mar. 18	Saint Vincent, Minn.	48 56	97 14	May 8
Pensacola, Fla.	30 25	87 13	(¹)	Bismarck, Dak.	46 47	100 38	May 7
Mobile, Ala.	30 41	88 2	(¹)	Buford, Fort, Dak.	48 0	103 56	May 6
Montgomery, Ala.	32 23	86 18	Feb. 12	Totten, Fort, Dak.	47 57	98 57	May 7
Vicksburg, Miss.	32 22	90 53	Feb. 12	Northern Slope:			
New Orleans, La.	29 58	90 4	(¹)	Assinaboine, Fort, Mont.	48 32	109 42	May 7
Western Gulf States:				Benton, Fort, Mont.	47 50	110 40	Apr. 29
Shreveport, La.	32 30	93 40	Feb. 21	Custer, Fort, Mont.	45 43	107 34	Apr. 21
Fort Smith, Ark.	35 22	94 24	Feb. 16	Helena, Mont.	46 34	113 4	June 7
Little Rock, Ark.	34 45	92 0	Feb. 16	Maginnis, Fort, Mont.	47 12	109 10	May 6
Galveston, Tex.	29 18	94 47	(¹)	Poplar River, Mont.	48 8	105 10	May 7
Indianola, Tex.	28 32	96 31	(¹)	Shaw, Fort, Mont.	47 31	111 48	May 10
Palestine, Tex.	31 45	95 40	Feb. 13	Deadwood, Dak.	44 23	103 43	May 10
Rio Grande Valley:				Cheyenne, Wyo.	41 8	104 48	May 7
Brownsville, Tex.	26 53	97 26	(¹)	North Platte, Nebr.	41 8	100 45	Mar. 5
Rio Grande City, Tex.	26 23	98 48	(¹)	Middle Slope:			
Ohio Valley and Tennessee:				Denver, Colo.	39 45	106 0	May 11
Chattanooga, Tenn.	35 4	85 15	Mar. 18	Pike's Peak, Colo.	38 50	103 2	(¹)
Knoxville, Tenn.	35 56	83 58	Apr. 13	West Las Animas, Colo.	38 4	101 12	Apr. 2
Memphis, Tenn.	35 9	90 8	Mar. 8	Dodge City, Kans.	37 45	100 0	May 7
Nashville, Tenn.	36 10	86 47	Mar. 28	Elliott, Fort, Tex.	33 30	100 21	Mar. 28
Louisville, Ky.	38 15	85 45	Apr. 14	Southern Slope:			
Greencastle, Ind.	39 40	86 53	Apr. 14	Sill, Fort, Ind. T.	31 40	98 23	Feb. 1
Indianapolis, Ind.	39 46	86 10	Apr. 14	Concho, Fort, Tex.	31 25	106 34	Feb. 1
Cincinnati, Ohio.	39 0	84 30	Mar. 28	Davis, Fort, Tex.	30 38	103 56	Feb. 1
Columbus, Ohio.	39 58	83 0	Apr. 15	Stockton, Fort, Tex.	30 51	102 53	Feb. 12
Pittsburg, Pa.	40 32	80 2	May 10	Southern Plateau:			
Lower Lakes:				El Paso, Tex.	31 47	106 30	(¹)
Buffalo, N. Y.	42 53	78 53	May 9				

¹ Snow every month in the year.² No snow observed.

APPENDIX 46.

Average movement of the wind at stations of the Signal Service, United States Army, for each month and the year. (Compiled from the commencement of observations at each to and including December, 1884.)

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England:														
Eastport, Me.	Apr. 1, 1873	9,297.8	8,517.3	9,520.8	7,251.2	6,212.1	4,704.7	4,673.8	4,251.8	5,351.7	7,148.0	8,476.5	8,771.9	84,376.5
Portland, Me.	Jan. 15, 1871	5,750.7	5,673.5	6,467.0	6,363.7	5,762.4	4,910.2	4,524.7	4,165.4	4,815.5	5,485.4	5,903.1	5,903.1	67,346.4
Boston, Mass.	Nov. 1, 1870	7,349.2	7,206.7	8,444.2	7,372.0	6,568.5	5,602.4	5,939.0	5,308.9	5,997.8	6,719.9	7,302.2	7,447.9	81,908.3
Block Island, R. I.	Sept. 1, 1880	11,153.2	12,963.2	10,483.2	10,430.2	8,820.0	8,641.5	7,686.5	7,085.5	8,997.8	11,242.0	11,938.8	13,098.0	129,388.0
New Haven, Conn.	Dec. 10, 1872	5,073.4	5,612.1	6,976.3	6,503.2	5,489.8	4,591.2	4,504.5	4,331.5	4,862.4	5,460.3	5,841.8	5,908.5	66,004.9
New London, Conn.	Jan. 10, 1871	5,755.5	5,818.4	6,784.6	6,026.8	5,204.3	4,267.6	4,264.9	3,967.1	4,410.8	5,254.4	5,764.2	5,635.7	63,607.3
Middle Atlantic States:														
Albany, N. Y.	Dec. 22, 1873	5,787.9	5,618.0	6,515.6	6,019.6	5,186.4	4,277.7	3,831.9	3,319.8	3,015.0	4,522.7	5,168.8	5,427.4	59,240.9
New York City	Nov. 1, 1870	7,380.8	7,388.7	8,654.4	7,235.8	6,556.6	5,780.2	5,731.0	5,570.6	6,272.3	6,968.1	7,302.6	7,002.6	82,440.8
Philadelphia, Pa.	Jan. 1, 1871	7,581.2	7,308.2	8,815.8	7,996.8	7,187.8	6,461.5	6,240.0	5,629.1	5,946.5	6,013.0	6,955.5	7,483.1	84,123.4
Atlantic City, N. J.	Dec. 10, 1873	7,271.5	7,273.7	8,686.2	8,214.2	7,384.3	6,310.4	5,654.3	5,614.2	7,367.5	7,061.0	6,885.4	7,148.6	85,404.8
Harnget City, N. J.	Dec. 10, 1873	10,100.4	9,514.3	11,277.4	9,867.0	8,013.5	7,845.7	7,361.4	7,080.0	8,920.5	9,424.6	9,812.5	9,918.2	111,242.7
Cape May, N. J.	May 24, 1871	10,802.7	11,040.6	12,268.0	10,681.5	9,409.2	7,918.7	7,611.4	7,323.2	8,400.4	10,210.7	11,352.0	11,883.4	122,180.9
Sandy Hook, N. J.	Dec. 10, 1873	9,999.6	12,388.6	12,388.6	10,463.9	9,254.2	8,580.4	8,261.0	8,314.5	9,892.9	11,095.6	11,835.2	12,558.1	123,588.5
Del. Breakwater, Del.	Jan. 28, 1870	12,490.2	12,248.4	14,371.0	11,891.8	11,512.0	9,314.0	9,014.4	9,094.2	10,910.8	11,892.0	12,330.6	12,740.0	137,075.0
Baltimore, Md.	Jan. 1, 1871	4,163.9	4,128.3	5,227.6	4,947.4	4,404.0	3,253.3	3,153.1	3,040.0	3,761.4	3,941.7	3,982.6	4,215.4	51,023.5
Washington City	Nov. 1, 1870	4,703.1	4,776.7	6,344.2	5,732.6	4,876.2	4,238.5	4,048.8	3,835.7	3,814.0	4,935.8	4,411.5	4,817.5	51,755.4
Cane Henry, Va.	Dec. 15, 1873	9,584.5	9,159.1	10,837.1	9,848.5	8,728.1	7,981.5	7,328.5	7,310.3	9,000.8	9,678.9	9,785.9	10,046.0	110,020.2
Chincoteague, Va.	Mar. 16, 1880	8,890.8	10,681.8	10,681.8	10,064.6	9,223.4	6,678.6	7,168.6	7,280.2	7,968.6	9,210.0	8,684.4	8,684.4	100,194.5
Lyndeburg, Va.	May 24, 1871	2,767.8	3,007.9	3,830.4	3,353.3	2,680.2	2,323.7	2,269.7	2,060.8	1,889.2	2,141.2	2,825.2	2,727.2	31,876.0
Norfolk, Va.	Jan. 1, 1871	5,588.2	6,917.0	6,917.0	6,267.2	5,793.1	4,994.6	4,994.6	4,741.5	4,737.9	5,330.1	5,452.5	5,654.5	67,180.8
South Atlantic States:														
Charlotte, N. C.	Oct. 4, 1878	8,900.0	4,308.5	4,938.8	4,498.2	3,963.7	3,745.2	3,395.8	3,354.3	3,447.3	3,874.5	3,593.2	3,801.0	46,436.8
Battersea, N. C.	Dec. 1, 1882	11,094.2	11,077.2	12,690.8	12,082.5	10,900.8	10,492.8	10,180.5	9,794.5	9,542.2	10,114.8	9,258.5	10,320.8	127,404.5
Kitty Hawk, N. C.	Jan. 15, 1873	11,347.7	10,873.3	11,596.6	11,536.6	10,754.9	9,705.8	9,087.1	8,267.3	10,686.8	11,918.4	11,690.7	11,533.0	136,611.2
Macon, Fort, N. C.	May 23, 1875	9,447.2	9,284.0	10,689.0	9,670.0	9,312.8	8,810.0	8,403.8	8,456.6	9,305.5	9,908.0	9,040.0	9,510.0	114,988.7
Smithville, N. C.	Oct. 1, 1873	6,417.2	6,261.0	7,732.2	7,732.2	7,341.2	7,410.9	7,893.6	6,757.0	6,618.0	6,118.0	6,083.8	6,477.8	64,170.1
Wilmington, N. C.	Jan. 1, 1871	5,325.8	5,772.8	6,784.5	6,361.6	5,247.2	4,072.4	4,069.6	4,222.7	4,232.0	4,537.8	5,381.6	5,415.9	62,410.0
Charleston, S. C.	Jan. 5, 1871	5,473.8	5,493.0	6,346.7	6,261.3	6,063.3	5,903.5	5,679.5	5,286.2	6,638.0	5,692.0	5,381.6	5,268.4	70,514.3
Augusta, Ga.	Nov. 2, 1870	2,606.8	2,614.3	3,011.2	3,197.1	2,857.8	2,760.5	2,432.2	2,388.2	2,490.9	2,863.0	2,631.3	2,466.7	33,073.2
Savannah, Ga.	Jan. 1, 1871	4,661.5	4,811.4	5,863.8	5,161.4	4,509.8	4,541.4	4,207.1	4,025.5	4,103.7	4,516.1	4,528.9	4,634.3	58,363.9
Jacksonville, Fla.	Sept. 1, 1871	4,245.1	4,637.5	5,934.4	5,466.5	5,008.8	4,908.8	4,701.0	4,321.5	4,506.6	5,103.6	4,988.7	4,481.4	56,496.2
Florida Peninsula:														
Cedar Keys, Fla.	Nov. 7, 1870	0,700.0	0,413.6	8,231.4	7,478.4	7,220.4	6,730.2	6,224.0	6,394.8	5,990.0	6,988.8	5,700.2	6,545.5	80,887.8
Key West, Fla.	Nov. 1, 1870	8,112.0	6,978.3	6,326.3	7,549.7	9,965.1	8,822.2	5,553.6	5,443.7	3,872.0	8,760.0	8,071.9	8,749.4	83,960.0
Sanford, Fla.	Sept. 1, 1882	5,972.0	4,530.0	4,967.0	4,967.0	4,413.0	4,096.0	3,553.3	3,423.0	4,410.0	5,014.0	5,337.5	4,710.5	50,103.0

Average movement of the wind at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations:	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Eastern Gulf States:		<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Atlanta, Ga.....	Sept. 25, 1878	7,643.8	7,668.2	8,240.3	8,060.7	8,987.8	8,442.8	8,470.7	8,977.8	8,540.8	8,477.0	8,705.7	8,871.5	78,722.7
Pensacola, Fla.....	Oct. 27, 1879	7,384.0	7,654.9	8,240.3	8,414.6	8,981.4	8,850.6	8,694.4	8,048.8	8,812.4	8,617.0	8,337.2	8,517.5	77,414.8
Mobile, Ala.....	Nov. 7, 1870	7,554.2	7,681.3	8,240.3	8,217.1	8,473.5	8,194.2	8,680.2	8,731.5	8,132.7	8,617.0	8,683.5	8,810.2	53,342.0
Montgomery, Ala.....	Nov. 9, 1870	7,454.4	7,681.3	8,240.3	8,217.1	8,473.5	8,194.2	8,680.2	8,731.5	8,132.7	8,617.0	8,683.5	8,810.2	40,072.1
Vicksburg, Miss.....	Sept. 10, 1871	7,434.4	7,681.3	8,240.3	8,217.1	8,473.5	8,194.2	8,680.2	8,731.5	8,132.7	8,617.0	8,683.5	8,810.2	47,566.9
New Orleans, La.....	Nov. 1, 1870	7,622.5	7,681.3	8,240.3	8,217.1	8,473.5	8,194.2	8,680.2	8,731.5	8,132.7	8,617.0	8,683.5	8,810.2	64,606.1
Western Gulf States:		<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Shreveport, La.....	Sept. 3, 1871	8,818.5	8,012.0	4,712.8	4,684.7	3,900.9	3,248.2	3,127.9	2,752.0	2,922.8	3,142.4	3,480.0	3,754.2	43,520.6
Fort Smith, Ark.....	June 1, 1882	4,456.0	4,813.5	4,933.0	4,671.5	4,080.0	2,763.2	2,841.3	2,863.7	2,856.7	3,237.0	3,332.0	4,316.0	43,982.0
Little Rock, Ark.....	July 1, 1879	4,081.4	4,190.8	5,053.8	7,714.5	7,822.2	3,178.4	2,864.5	2,829.5	2,451.2	7,070.0	7,889.1	4,130.3	43,034.7
Galveston, Tex.....	April 19, 1871	7,778.8	7,289.0	7,575.2	7,918.9	7,311.2	3,036.7	8,800.6	8,282.1	6,481.2	8,737.8	10,123.3	7,853.1	112,673.5
Indianola, Tex.....	May 1, 1872	10,425.8	9,863.5	10,651.2	11,284.3	9,722.5	3,236.7	8,063.5	7,075.5	7,966.5	8,737.8	10,123.3	10,425.1	112,673.5
Palentine, Tex.....	Dec. 3, 1881	7,664.0	7,664.0	7,615.5	7,411.3	7,743.7	9,917.7	6,053.3	5,034.7	5,551.7	6,323.3	9,962.3	7,157.9	76,972.0
Rio Grande Valley:		<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Brownsville, Tex.....	Aug. 25, 1875	5,405.4	5,923.9	5,828.4	5,604.9	5,711.2	5,141.6	5,392.0	3,896.1	3,338.5	3,864.0	4,913.1	5,362.5	61,880.6
Rio Grande City, Tex.....	May 28, 1875	5,263.6	5,450.8	5,741.3	5,732.8	7,160.9	9,931.4	7,917.0	5,439.7	4,874.7	4,524.3	4,531.0	4,392.8	70,665.2
Ohio Valley & Tennessee:		<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Chattanooga, Tenn.....	Jan. 8, 1879	4,522.3	4,164.3	5,767.0	5,163.2	4,062.7	3,632.7	3,511.5	3,395.7	3,194.7	3,532.5	3,923.3	4,682.2	50,492.8
Knoxville, Tenn.....	Jan. 1, 1871	4,498.2	4,019.6	5,638.8	5,112.1	4,236.7	3,803.9	3,594.6	3,153.9	3,176.9	3,242.8	3,794.2	4,283.2	49,124.5
Memphis, Tenn.....	Feb. 28, 1871	4,503.2	4,013.2	4,943.5	4,828.4	3,656.4	3,435.3	3,301.2	3,005.3	3,200.8	3,629.5	4,207.3	4,411.3	47,451.5
Nashville, Tenn.....	Nov. 1, 1870	3,453.3	3,461.5	4,135.4	3,828.4	3,251.9	2,969.8	2,692.1	2,433.4	2,548.6	2,917.0	3,284.6	3,532.7	39,328.7
Louisville, Ky.....	Sept. 11, 1871	5,900.6	5,900.6	6,670.5	5,923.3	5,195.6	4,822.8	4,253.7	3,994.8	4,318.7	4,960.0	5,357.1	5,699.6	62,890.0
Indianapolis, Ind.....	Feb. 10, 1871	4,787.8	4,417.2	5,512.0	5,028.9	4,272.5	3,699.8	3,215.7	2,837.4	3,365.8	3,791.9	4,150.0	4,698.8	49,990.4
Cincinnati, Ohio.....	Nov. 1, 1870	4,710.6	4,604.9	5,530.1	4,818.8	4,305.2	3,933.8	3,562.5	3,196.2	3,436.0	3,888.4	4,801.3	4,575.8	51,098.1
Columbus, Ohio.....	July 1, 1878	6,018.3	6,224.3	5,968.0	5,163.2	5,245.5	4,806.2	4,592.5	4,701.9	4,319.9	4,701.9	5,631.6	5,065.1	63,996.3
Pittsburg, Pa.....	Nov. 1, 1870	5,675.4	4,943.8	5,601.3	4,762.0	4,126.3	3,963.8	3,798.0	3,278.6	3,563.6	4,031.5	4,794.9	5,150.9	52,921.2
Lower Lakes:		<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Buffalo, N. Y.....	Nov. 1, 1870	5,513.5	7,323.2	7,747.9	6,248.1	5,908.5	5,182.2	4,416.3	4,935.8	5,890.5	6,854.5	7,921.3	9,023.6	80,904.5
Owego, N. Y.....	Nov. 1, 1870	7,945.9	7,401.8	7,677.9	6,305.5	5,652.0	4,701.6	4,432.9	4,432.9	5,325.4	6,460.8	7,631.4	8,096.1	76,162.1
Rochester, N. Y.....	Nov. 1, 1870	8,543.3	7,384.5	7,643.4	6,543.4	7,338.1	5,978.8	5,333.4	5,008.4	6,068.3	7,782.3	7,534.9	8,064.8	87,437.4
Erie, Pa.....	May 25, 1873	8,718.3	7,923.9	8,354.6	7,704.7	6,812.3	5,968.5	5,478.3	5,290.9	6,309.3	7,867.0	9,006.9	9,575.3	98,505.8
Cleveland, Ohio.....	Nov. 1, 1870	8,036.8	6,953.3	7,983.5	6,643.1	6,226.9	5,648.2	5,454.5	5,123.2	6,271.2	7,357.9	8,114.6	8,216.5	83,798.8
Sandusky, Ohio.....	Aug. 2, 1877	9,643.9	10,980.0	10,248.8	10,248.8	9,467.7	7,668.4	7,064.7	7,003.8	8,426.6	9,652.4	10,414.6	10,094.8	111,817.8
Toledo, Ohio.....	Nov. 1, 1870	7,003.6	6,147.6	6,811.8	5,877.0	5,319.2	4,881.6	4,040.5	4,081.6	5,314.8	6,277.1	6,612.3	7,652.8	76,929.8
Detroit, Mich.....	Nov. 1, 1870	5,260.9	5,967.7	6,732.3	6,168.7	5,945.3	5,070.1	4,862.8	4,624.4	4,968.3	5,592.9	6,094.4	6,420.9	68,818.8
Upper Lakes:		<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Alpena, Mich.....	Sept. 10, 1872	6,889.8	6,948.9	7,621.1	6,717.6	6,252.7	5,690.1	5,592.8	5,303.8	6,045.8	6,755.3	6,908.0	6,907.9	79,043.0
Keweenaw, Mich.....	May 24, 1871	6,083.9	6,083.9	7,581.3	7,238.3	6,965.2	6,097.9	6,091.2	5,786.9	7,003.1	7,826.9	7,072.7	7,198.1	83,894.7
Grand Haven, Mich.....	May 24, 1871	5,273.5	5,273.5	5,931.2	5,443.5	7,876.7	6,447.3	6,274.5	6,097.7	7,177.2	8,329.2	8,829.2	8,024.3	86,698.7
Marquette City, Mich.....	Aug. 20, 1882	4,490.5	7,015.9	7,798.5	6,819.0	6,971.0	5,520.5	6,308.5	4,183.0	6,774.7	8,177.7	8,650.0	8,650.0	86,256.0

Marquette, Mich	May 1, 1871	6,972.8	6,001.6	6,823.5	6,005.7	5,423.3	4,908.1	6,083.3	5,241.2	6,108.8	6,021.1	6,815.7	7,202.7	72,755.7
Port Union, Mich	July 23, 1874	7,675.4	7,219.4	7,036.6	7,718.5	7,434.6	5,970.0	6,777.7	5,404.5	6,005.9	6,019.3	7,470.2	7,788.5	85,440.0
Chicago, Ill	Nov. 1, 1870	6,902.8	6,115.9	7,244.2	6,817.5	6,874.6	5,408.2	6,230.4	6,137.8	6,005.9	6,243.3	7,470.2	6,431.3	81,410.7
Milwaukee, Wis	Nov. 1, 1870	8,814.2	8,320.6	8,671.1	8,562.5	7,878.6	6,721.8	8,542.3	6,635.5	7,218.9	8,601.2	8,601.2	9,127.5	91,530.0
Duluth, Minn	Nov. 1, 1870	4,900.3	5,208.8	6,883.0	6,883.6	5,208.6	4,657.2	5,019.3	4,882.7	5,019.3	5,948.6	5,331.9	5,250.1	61,000.8
Upper Mississippi Valley:														
St. Paul, Minn	Nov. 1, 1870	5,704.4	5,481.3	6,883.0	6,983.7	7,012.5	6,150.8	5,328.8	5,314.5	5,912.5	6,828.8	5,750.4	5,574.2	72,535.6
La Crosse, Wis	Oct. 15, 1871	5,142.2	5,267.3	6,218.6	6,268.4	5,267.3	5,127.8	5,268.2	4,984.9	5,032.5	5,833.9	5,456.4	5,474.2	64,572.0
Davenport, Iowa	May 24, 1871	4,302.9	6,104.7	5,968.2	7,565.4	4,982.0	4,318.3	4,947.3	4,784.2	5,800.0	6,018.8	6,223.6	5,142.9	72,860.5
Des Moines, Iowa	Aug. 1, 1873	4,815.3	5,044.7	5,968.2	6,011.0	4,982.0	4,318.3	5,248.5	4,464.5	4,980.2	5,871.5	6,045.7	4,710.0	83,820.5
Dubuque, Iowa	July 16, 1873	3,612.1	5,788.6	4,816.5	5,068.6	4,406.8	3,824.3	5,248.5	3,158.9	5,412.6	5,907.5	5,764.7	3,662.4	68,861.6
Keokuk, Iowa	July 16, 1873	6,013.8	5,678.1	7,060.9	7,268.6	6,457.3	5,258.3	6,625.7	4,678.5	4,155.9	5,811.6	5,940.0	5,648.3	69,861.6
Galva, Ill	June 1, 1871	5,803.2	5,840.6	7,457.6	6,472.5	5,599.3	4,693.2	5,919.0	4,688.4	5,747.7	6,953.8	5,636.0	5,800.1	64,500.0
Springfield, Ill	July 1, 1870	7,108.6	7,063.4	8,011.0	7,894.8	6,824.4	6,824.4	6,535.0	5,112.0	5,747.7	6,953.8	5,781.2	6,804.7	76,188.4
St. Louis, Mo	Nov. 1, 1870	7,884.9	7,144.8	8,761.9	7,879.8	7,376.0	6,423.4	8,815.2	5,598.4	6,234.6	7,075.7	7,674.6	7,725.7	86,188.4
Missouri Valley:														
Leavenworth, Kans	May 21, 1871	5,379.7	5,221.5	6,889.5	6,655.4	5,651.9	4,968.8	4,053.0	3,919.4	4,671.2	4,888.6	5,208.6	5,047.8	62,283.3
Omaha, Nebr	Nov. 1, 1871	6,987.9	6,430.5	6,928.4	7,625.4	6,928.4	5,740.0	5,214.3	5,095.5	5,649.5	6,438.3	6,686.6	6,047.7	77,357.2
Bennett, Fort, Dak	Dec. 22, 1870	4,890.5	7,293.7	5,984.7	6,915.2	7,185.5	6,701.3	6,814.2	6,537.2	7,202.5	6,876.0	5,068.0	4,680.6	66,438.5
Huron, Dak	July 1, 1881	7,893.0	7,293.7	8,446.0	8,988.0	8,375.0	6,701.3	7,043.8	6,937.2	7,707.0	7,614.5	7,210.2	6,984.0	89,137.2
Yankton, Dak	April 1, 1873	6,498.1	6,411.4	7,896.5	8,613.8	7,898.8	6,732.1	5,246.0	5,258.5	5,953.3	6,867.3	6,397.3	6,081.1	79,507.0
Extreme Northwest:														
Moorhead, Minn	Jan. 1, 1881	8,268.5	7,459.8	8,743.7	8,017.2	8,672.8	7,387.0	6,915.8	7,437.5	7,784.0	8,117.2	7,941.8	7,998.5	91,063.0
Saint Vincent, Minn	Sept. 5, 1880	7,238.0	6,504.0	7,196.8	6,908.8	7,122.8	5,984.0	5,833.0	5,536.0	6,087.2	6,884.6	7,266.2	7,227.8	78,597.0
Bismarck, Dak	Sept. 15, 1874	5,977.1	5,794.9	6,998.0	8,137.9	7,741.7	6,657.3	6,681.7	6,387.4	6,511.4	7,137.2	6,239.1	5,911.8	80,332.4
Buford, Fort, Dak	Oct. 23, 1873	5,118.0	4,903.8	6,048.7	7,390.8	7,119.3	6,229.7	6,625.0	6,793.7	6,306.0	6,092.8	5,910.5	5,183.5	74,533.2
Northern Slope:														
Assiniboine, Fort, Mont	Oct. 6, 1879	4,149.2	7,982.2	7,224.0	7,476.3	7,203.8	7,059.3	7,630.7	6,500.8	4,447.5	7,803.8	8,532.4	5,168.8	91,634.7
Benton, Fort, Mont	Oct. 11, 1879	5,405.3	5,884.5	6,604.5	5,675.8	5,820.7	5,017.0	5,037.5	4,336.4	6,475.5	5,454.4	5,925.2	5,568.0	54,560.5
Custer, Fort, Mont	Dec. 5, 1878	4,952.5	4,876.0	5,829.5	6,162.3	5,978.0	4,924.5	5,199.8	5,132.8	4,787.2	5,115.8	5,925.2	4,911.2	65,583.0
Helena, Mont	Oct. 15, 1879	3,450.2	3,882.0	4,624.2	4,470.6	4,901.6	4,694.4	4,673.8	4,160.6	3,599.2	4,026.3	3,568.8	3,415.8	50,897.2
Magnolia, Fort, Mont	July 14, 1880	11,342.5	8,199.0	8,199.0	7,482.0	7,744.8	7,313.0	7,389.5	6,997.0	6,939.7	8,844.7	9,760.7	9,300.0	94,191.0
Shaw, Fort, Mont	April 1, 1880	8,870.5	8,431.8	9,645.5	7,482.0	6,784.8	6,945.2	6,654.6	6,920.3	5,905.2	7,384.8	9,760.7	8,297.8	83,812.0
Deadwood, Dak	Dec. 25, 1877	3,990.1	2,467.3	2,839.7	3,890.1	3,152.7	3,254.6	3,161.0	3,165.5	2,953.2	3,205.2	2,518.4	2,719.1	35,148.6
Cheyenne, Wyo	Nov. 1, 1870	9,518.6	8,417.9	9,285.3	8,498.9	7,796.8	6,540.0	6,618.6	6,041.2	6,427.6	7,407.0	7,947.8	8,297.1	92,880.1
North Platte, Nebr	Sept. 18, 1874	7,290.3	6,678.5	9,041.3	9,677.2	10,201.0	9,090.5	8,808.8	8,354.9	8,269.9	8,421.1	7,163.6	6,450.7	100,188.1
Middle Slope:														
Deaver, Colo	Nov. 19, 1871	4,170.0	5,439.5	5,982.3	5,253.1	5,082.3	4,593.7	4,574.1	4,200.9	4,007.7	4,413.5	4,391.6	4,409.9	55,299.0
Pike's Peak, Colo	Nov. 1, 1871	13,632.6	17,146.6	18,788.6	15,849.2	15,980.7	13,655.7	15,459.8	6,058.5	11,567.2	15,710.6	14,158.9	16,493.1	180,175.3
West Las Animas, Colo	Oct. 1, 1871	5,959.5	5,990.0	7,149.0	8,394.7	8,441.3	6,217.0	5,549.0	5,905.7	6,400.7	6,214.7	4,453.8	5,147.0	73,318.5
Dodge City, Kans	Sept. 15, 1874	6,083.7	7,793.2	10,438.2	10,707.9	10,733.5	9,644.3	9,241.3	8,283.5	8,915.5	8,910.5	7,503.1	7,045.5	109,807.9
Elliot, Fort, Tex	Nov. 20, 1879	8,200.4	7,879.2	9,943.2	10,398.0	10,081.6	8,631.0	7,424.0	6,116.4	7,239.4	8,098.0	7,155.0	7,483.7	100,120.7
Southern Slope:														
Sill, Fort, Ind, T	June 23, 1875	7,499.7	7,785.0	9,394.5	9,887.2	9,743.2	8,751.2	7,439.9	6,233.0	7,295.8	7,810.0	6,853.6	7,309.0	95,985.0
Concho, Fort, Tex	Oct. 10, 1877	6,190.2	6,941.7	7,263.3	7,993.4	8,235.9	7,149.6	6,588.4	5,891.1	5,608.6	5,998.3	5,698.3	4,411.7	80,590.5
Davis, Fort, Tex	Dec. 24, 1877	4,144.2	5,921.3	4,907.7	4,587.4	4,270.9	3,857.4	5,589.1	5,413.8	3,154.8	8,809.8	3,025.2	4,608.2	48,213.0
Stockton, Fort, Tex	Feb. 26, 1876	6,831.7	7,176.0	7,176.0	7,719.1	8,101.3	8,901.1	8,068.6	7,071.6	7,661.5	6,722.9	5,108.1	5,129.4	81,390.4
Southern Pineau:														
Santa Fe, N. Mex	Nov. 20, 1871	5,158.6	4,732.5	6,000.3	6,208.6	6,330.2	5,288.8	4,981.1	4,557.3	4,281.1	4,922.4	4,693.2	4,670.0	60,708.4
El Paso, Tex	Nov. 5, 1871	3,536.7	3,965.5	4,823.3	6,637.0	4,823.3	3,743.8	4,436.4	2,535.6	2,607.6	3,007.3	3,164.7	3,482.1	45,640.2

Average movement of the wind at stations of the Signal Service, United States Army, for each month and the year, &c.—Continued.

Stations.	Established.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
South'n Plateau—Cont'd:														
Apache, Fort, Ariz.	Oct. 9, 1877	3,762.5	3,944.5	5,017.2	5,792.5	6,775.3	5,537.7	4,541.3	3,852.5	4,042.8	4,346.2	3,817.2	3,837.6	58,292.8
Grand, Fort, Ariz.	Nov. 1, 1875	4,780.8	5,091.2	5,546.0	6,377.3	5,935.5	5,699.8	4,963.2	4,440.5	5,154.0	5,290.0	4,906.9	4,828.2	62,943.4
Prescott, Ariz.	Nov. 19, 1873	3,701.2	4,212.8	5,337.7	6,162.7	5,994.7	5,293.8	4,240.6	3,574.0	3,113.2	3,330.2	3,530.2	3,502.2	53,502.2
Yuma, Ariz.	Nov. 18, 1873	4,210.0	4,734.0	4,870.6	4,476.4	4,274.7	3,615.6	4,422.5	4,067.5	3,868.0	3,315.1	3,567.0	3,675.4	47,641.8
Middle Plateau:														
Winnemucca, Nev.	July 1, 1877	6,954.7	6,407.5	7,162.2	6,300.8	6,484.3	6,609.8	7,212.8	6,008.5	6,141.5	6,331.8	5,668.7	6,450.3	75,216.0
Salt Lake City, Utah	Mar. 10, 1874	2,808.5	2,835.7	4,268.7	4,180.5	4,321.4	4,446.3	4,256.2	4,210.5	3,945.2	3,670.2	2,806.2	2,991.8	46,365.7
Northern Plateau:														
Boise City, Idaho	July 1, 1877	2,199.7	2,309.0	4,130.4	4,372.9	4,376.1	3,547.4	3,310.0	2,837.5	2,745.0	3,002.5	2,528.4	2,568.5	40,216.0
Lewiston, Idaho	July 1, 1877	2,431.4	2,117.5	4,468.8	2,556.0	2,412.8	2,094.0	2,366.6	2,050.6	1,960.4	1,530.8	1,694.4	2,155.0	24,022.0
Dayton, Wash.	July 1, 1879	3,292.2	3,640.8	2,244.2	4,532.5	4,142.8	3,904.0	3,868.3	3,078.8	3,510.0	4,203.2	3,518.5	3,501.8	46,224.0
Spokane Falls, Wash.	Feb. 6, 1881	2,760.3	3,038.8	3,463.8	4,407.2	4,083.8	4,008.8	3,967.8	3,323.2	3,917.5	3,180.8	2,491.0	2,731.5	38,858.0
North Pacific Coast:														
Campy, Fort, Wash.	Sept. 1, 1883	11,562.0	7,714.0	5,710.0	7,129.0	6,717.0	6,574.0	4,239.0	5,503.0	6,900.5	8,087.5	8,603.5	9,040.5	89,772.0
Olympia, Wash.	July 1, 1877	3,080.3	3,952.9	3,020.6	2,960.0	2,897.9	2,500.6	2,601.5	2,168.8	2,228.8	2,820.2	2,612.2	3,110.4	37,532.8
Tacoma Island, Wash.	Oct. 1, 1875	12,136.0	11,705.0	8,368.0	7,444.0	8,138.0	5,672.0	8,790.0	6,016.0	6,531.0	9,202.5	12,475.0	12,404.0	105,498.0
Portland, Oreg.	Nov. 1, 1871	4,363.7	2,621.4	3,781.1	2,432.5	3,607.4	3,392.7	2,568.1	3,056.6	3,623.1	3,031.0	3,181.2	3,497.8	40,573.9
Roseburg, Oreg.	July 15, 1877	2,562.1	2,065.6	2,378.9	2,538.7	2,662.6	2,019.0	2,613.4	2,443.5	1,968.2	1,868.0	1,456.0	1,797.1	37,263.5
Middle Pacific Coast:														
San Francisco, Cal.	July 27, 1882	11,648.5	12,120.0	10,606.0	15,133.0	12,607.0	12,066.0	10,385.0	14,645.0	11,867.0	11,763.0	11,825.5	11,542.7	.....
San Diego, Cal.	July 1, 1877	5,018.7	5,631.3	6,471.7	6,050.0	6,033.0	5,492.6	4,481.9	3,703.3	4,468.0	4,897.2	4,041.9	5,002.1	60,036.6
San Francisco, Cal.	July 1, 1877	4,761.1	4,554.1	5,433.9	5,469.1	5,513.7	5,504.3	6,104.5	4,487.2	4,071.5	3,846.0	3,739.9	4,565.2	57,067.4
San Francisco, Cal.	Mar. 8, 1871	5,283.2	4,908.8	6,624.0	7,189.9	8,900.6	8,980.5	9,495.8	8,962.9	7,134.5	5,762.0	4,397.4	4,941.9	82,091.6
South Pacific Coast:														
Los Angeles, Cal.	July 1, 1877	4,276.2	4,088.3	4,101.7	3,950.4	4,038.1	3,715.7	3,602.2	3,401.4	3,368.1	3,591.1	3,508.4	3,825.1	45,290.3
San Diego, Cal.	Nov. 1, 1871	2,566.5	4,157.4	4,896.7	4,963.8	4,954.8	4,583.7	4,736.3	4,517.3	4,308.2	4,066.5	3,615.1	3,830.8	52,328.9
Alaska Stations:														
Saint Michael's, Fort, Alaska	June 28, 1874	10,310.2	8,732.2	9,576.4	8,538.0	7,431.0	7,505.4	8,381.8	9,084.8	8,965.9	10,580.0	9,962.2	8,903.8	105,288.8
Sitka, Alaska	Mar. 30, 1881	7,042.7	6,492.3	7,067.7	6,205.2	6,475.8	6,084.5	5,426.5	4,634.0	5,476.9	6,686.0	8,080.0	9,150.2	79,085.7
Umanak, Alaska	Aug. 18, 1878	9,247.0	10,566.0	9,933.0	9,288.8	8,206.0	7,594.3	7,276.8	6,515.0	9,064.3	8,700.5	8,841.4	10,174.8	103,501.7
Behring's Island, Behring Sea	May 22, 1882	11,906.5	11,878.5	10,827.5	9,384.0	8,970.5	7,991.0	7,300.0	6,968.3	7,362.3	11,502.7	9,921.0	9,868.7	111,170.8

APPENDIX 47.

Average hourly velocity of the wind, in miles, at stations of the Signal Service, United States Army, for each month and the year. (Computed from the commencement of observations at each, to and including December, 1884.)

[The average hourly velocity is obtained by dividing the average monthly movement by twenty-four times the number of days in the month.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
New England:													
Eastport, Me.....	12.4	12.5	12.8	10.1	8.3	6.7	6.3	5.7	7.4	9.6	11.8	11.8	9.6
Portland, Me.....	7.7	8.4	9.1	8.8	7.8	6.9	6.6	5.8	6.7	7.4	8.3	7.9	7.6
Boston, Mass.....	9.9	10.6	11.3	10.1	8.8	7.8	7.4	7.1	8.2	9.0	10.3	10.0	9.2
Block Island, R. I.....	17.6	16.5	17.3	14.0	14.0	12.2	11.6	10.3	13.7	15.1	16.6	17.5	14.8
New Haven, Conn.....	8.0	8.3	9.4	9.0	7.4	6.4	6.1	5.8	6.8	7.4	8.1	7.0	7.6
New London, Conn.....	7.7	8.6	9.1	8.4	7.1	6.1	5.7	5.3	6.1	7.1	8.0	7.6	7.2
Middle Atlantic States:													
Albany, N. Y.....	7.8	8.3	8.8	8.4	7.0	5.9	5.2	4.5	5.0	6.1	7.2	7.3	6.8
New York City.....	9.9	10.9	11.6	10.0	8.6	8.0	7.7	7.5	8.7	9.4	10.1	10.2	9.4
Philadelphia, Pa.....	10.2	10.8	11.8	11.1	9.7	9.0	8.4	7.6	8.3	9.3	9.7	10.1	9.7
Atlantic City, N. J.....	9.8	10.7	11.7	11.4	9.0	8.8	7.6	8.9	10.1	9.5	9.6	9.0	9.6
Barnegat City, N. J.....	14.9	14.0	15.2	13.7	12.0	10.9	9.9	10.7	12.4	12.7	13.6	13.3	12.8
Cape May, N. J.....	14.6	16.3	16.5	14.8	12.6	11.0	10.2	9.8	11.8	13.7	15.6	16.0	13.6
Sandy Hook, N. J.....	15.1	14.7	16.6	14.5	12.4	11.9	11.1	11.2	13.7	14.9	16.4	16.9	14.1
Delaware Breakwater, Del.....	16.8	18.1	19.3	16.9	15.5	13.8	12.1	12.2	15.2	16.0	17.0	17.1	15.8
Baltimore, Md.....	5.6	6.1	7.0	6.9	6.0	5.9	5.6	4.9	5.2	5.3	5.5	5.7	5.8
Washington City.....	6.3	7.1	8.5	8.0	6.5	5.9	5.4	4.8	5.3	5.4	6.1	6.5	6.5
Cape Henry, Va.....	12.9	13.5	14.6	13.7	11.7	11.1	9.8	9.8	12.5	13.0	13.6	13.5	12.5
Chincoteague, Va.....	12.9	13.1	14.4	13.0	12.4	10.7	9.6	9.8	11.1	12.4	12.9	11.7	12.0
Lynchburg, Va.....	3.7	4.4	5.1	4.7	3.9	3.2	3.1	2.8	2.6	2.9	3.2	3.7	3.6
Norfolk, Va.....	7.5	8.6	9.3	8.7	7.8	7.3	6.7	6.4	6.6	7.2	7.6	7.6	7.0
South Atlantic States:													
Charlotte, N. C.....	5.2	6.4	6.6	6.2	5.2	5.2	4.6	4.5	4.8	4.9	5.0	5.1	5.3
Hatteras, N. C.....	14.9	16.3	16.0	10.7	14.7	14.6	13.7	13.2	13.8	13.6	12.9	13.9	14.0
Kitty Hawk, N. C.....	15.3	16.0	15.9	10.0	14.5	13.7	12.2	12.4	14.8	15.1	16.1	15.5	14.8
Macon, Fort, N. C.....	12.7	13.7	14.4	13.4	12.5	12.4	11.3	11.6	12.9	13.4	12.6	12.8	12.8
Smithville, N. C.....	8.6	9.8	10.9	10.7	9.9	10.8	10.0	9.1	9.2	8.5	8.4	8.7	9.0
Wilmington, N. C.....	7.2	7.8	9.1	8.7	7.2	7.0	6.0	5.7	5.9	6.1	6.7	7.4	7.1
Charleston, S. C.....	7.4	8.1	8.8	8.0	8.7	8.2	7.6	7.2	7.8	7.7	7.4	7.1	7.0
Augusta, Ga.....	3.5	4.3	4.9	4.4	4.0	3.9	3.3	3.1	3.4	3.8	3.6	3.3	3.8
Savannah, Ga.....	6.3	7.1	7.9	7.9	7.4	6.3	5.8	5.4	5.7	6.1	6.3	6.2	6.5
Jacksonville, Fla.....	5.7	6.8	7.9	7.0	6.7	6.5	6.4	6.1	6.4	6.9	6.4	6.0	6.6
Florida Peninsula:													
Cedar Key, Fla.....	9.0	9.5	11.1	10.4	9.7	9.3	8.4	8.6	8.3	9.3	7.9	8.4	9.2
Key West, Fla.....	10.9	10.3	11.2	10.5	9.4	7.7	7.5	7.8	8.2	11.8	11.2	11.1	9.8
Sanford, Fla.....	7.8	6.7	7.3	6.9	5.9	5.6	4.7	4.9	6.4	6.8	8.5	5.0	6.4
Eastern Gulf States:													
Atlanta, Ga.....	10.5	11.3	11.2	9.2	8.0	7.6	7.4	7.1	7.7	8.7	9.3	9.0	9.0
Pensacola, Fla.....	7.2	8.3	8.6	8.9	8.4	8.1	6.8	6.8	6.7	7.0	7.4	7.4	7.7
Mobile, Ala.....	6.1	6.6	6.9	6.9	6.3	5.7	5.4	5.1	5.7	6.0	6.0	5.9	6.0
Montgomery, Ala.....	5.5	6.2	6.5	5.9	4.9	4.7	4.2	3.9	4.5	4.8	5.1	5.0	5.1
Vicksburg, Miss.....	6.0	6.5	6.9	6.7	5.2	4.5	4.1	3.8	3.9	4.8	6.1	0.3	5.4
New Orleans, La.....	7.9	8.0	8.5	8.3	6.9	6.0	5.6	5.5	7.1	7.3	7.0	8.1	7.3
Western Gulf States:													
Shreveport, La.....	5.1	5.9	6.3	6.4	5.2	4.5	4.2	3.7	4.1	4.2	4.9	5.0	5.0
Fort Smith, Ark.....	6.0	6.3	6.6	6.4	5.5	3.9	3.8	3.6	4.0	4.4	4.6	5.8	5.1
Little Rock, Ark.....	5.5	6.2	6.8	6.5	5.2	4.3	4.4	3.8	3.8	4.8	5.3	5.6	5.2
Galveston, Tex.....	10.5	10.7	10.2	11.0	9.8	8.4	7.8	7.1	9.0	0.5	10.9	10.5	9.6
Indianola, Tex.....	14.0	14.7	14.3	16.4	13.1	11.4	10.8	9.5	11.1	11.7	14.1	14.0	12.9
Palestine, Tex.....	8.5	11.2	10.5	10.3	9.1	6.8	8.1	6.6	7.7	8.5	8.8	9.6	8.8
San Antonio, Tex.....	4.8	5.6	4.9	4.9	4.8	4.8	4.6	3.8	4.2	4.2	4.9	4.8	4.7
Rio Grande Valley:													
Brownsville, Tex.....	7.3	8.7	8.5	9.2	7.8	7.1	7.2	5.2	4.6	5.2	6.8	7.2	7.1
Rio Grande City, Tex.....	7.1	8.0	7.7	9.3	9.0	9.6	10.6	7.3	6.8	8.1	7.3	5.8	7.8
Ohio Valley and Tennessee:													
Chattanooga, Tenn.....	6.1	7.6	7.8	7.2	5.5	5.0	4.7	4.4	4.4	4.7	5.4	6.3	5.8
Knoxville, Tenn.....	6.0	6.8	7.6	7.1	5.8	5.3	4.7	4.2	4.4	4.4	5.3	5.8	5.0
Memphis, Tenn.....	6.1	5.9	6.7	6.7	4.9	4.8	4.4	4.0	4.5	4.9	5.8	5.9	5.4
Nashville, Tenn.....	4.6	5.1	5.5	5.3	4.4	4.0	3.5	3.3	3.5	3.9	4.0	4.7	4.4
Louisville, Ky.....	7.8	8.6	9.0	8.3	7.0	6.7	5.7	5.4	6.0	6.5	7.4	7.6	7.0

Average hourly velocity of the wind, in miles, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Ohio Valley and Tennessee—													
Continued:													
Indianapolis, Ind	6.4	6.5	7.4	7.0	5.7	5.1	4.3	4.5	4.7	5.1	5.8	6.3	5.7
Cincinnati, Ohio	6.3	6.8	7.4	6.7	5.8	5.5	4.8	4.3	4.8	5.2	6.0	6.2	5.8
Columbus, Ohio	8.1	9.2	9.4	8.6	7.1	6.7	5.8	5.0	5.9	6.3	7.8	8.2	7.3
Pittsburg, Pa.	6.8	6.8	7.5	6.6	5.5	5.5	5.1	4.4	4.9	5.4	6.7	6.9	6.0
Lower Lakes:													
Buffalo, N. Y.	11.5	10.8	10.4	8.7	7.9	7.2	7.3	6.6	8.1	9.2	11.0	12.1	9.2
Oswego, N. Y.	10.7	10.9	10.3	8.8	7.6	6.4	6.8	6.0	7.4	8.7	10.6	10.9	8.7
Rochester, N. Y.	11.5	11.6	11.7	10.5	9.8	8.3	7.7	7.0	8.3	9.1	10.5	10.8	9.7
Erie, Pa.	11.7	11.7	11.2	10.7	8.9	8.3	7.4	7.1	8.8	10.3	12.5	12.9	10.1
Cleveland, Ohio	10.8	10.3	10.7	9.2	8.4	7.8	7.3	6.9	8.7	9.8	11.3	11.1	9.4
Sandusky, Ohio	13.0	13.9	14.7	14.2	12.7	11.9	10.3	10.2	11.7	13.0	14.5	13.4	12.8
Toledo, Ohio	9.4	9.1	9.7	9.5	8.5	7.7	6.8	6.6	7.4	8.4	9.3	9.3	8.5
Detroit, Mich.	8.4	8.7	9.0	8.6	8.0	6.9	6.5	6.2	6.9	7.9	9.5	8.6	7.8
Upper Lakes:													
Alpena, Mich.	9.3	10.1	10.2	9.3	8.4	7.9	7.5	7.1	8.4	9.1	9.6	9.4	8.9
Escanaba, Mich.	9.4	9.8	10.4	10.1	9.0	8.5	8.0	7.7	9.7	10.5	9.8	9.7	9.4
Grand Haven, Mich.	11.7	12.2	12.0	11.7	10.6	9.0	8.4	8.2	10.0	11.8	12.3	12.1	10.8
Mackinaw City, Mich.	11.4	10.3	9.1	9.5	9.4	7.7	7.3	8.3	9.4	11.0	11.9	11.9	9.8
Marquette, Mich.	9.4	8.9	9.2	8.3	7.3	6.9	6.8	7.0	8.6	9.3	9.5	9.7	8.4
Port Huron, Mich.	10.3	10.7	10.7	10.7	10.0	8.3	7.8	7.3	8.4	9.5	10.4	10.5	9.6
Chicago, Ill.	9.0	9.0	9.7	9.5	8.6	7.6	7.0	6.9	7.8	8.9	8.5	8.6	8.4
Milwaukee, Wis.	10.5	12.3	12.9	11.9	10.6	9.3	8.5	8.9	10.0	11.3	11.9	12.3	10.9
Duluth, Minn.	6.6	7.7	7.9	8.8	7.0	6.2	6.7	6.6	7.6	8.0	7.4	7.1	7.3
Upper Mississippi Valley:													
Saint Paul, Minn.	7.7	8.1	8.8	9.7	9.4	8.4	7.2	7.4	8.2	8.9	8.0	7.5	8.3
La Crosse, Wis.	6.9	7.8	8.4	8.7	7.8	7.1	6.3	6.2	7.0	7.8	7.6	6.9	7.4
Davenport, Iowa.	8.5	9.0	10.3	10.5	9.1	7.6	6.6	6.4	7.7	8.1	8.6	8.3	8.4
Des Moines, Iowa.	6.5	7.4	8.0	8.3	6.6	5.9	5.0	4.7	5.6	5.9	6.5	6.2	6.4
Dubuque, Iowa.	4.9	5.6	6.5	7.0	5.9	5.3	4.4	4.2	4.7	5.3	5.2	4.8	5.3
Keokuk, Iowa.	8.1	8.4	9.5	10.1	8.7	7.3	6.2	6.3	7.5	7.8	8.3	7.6	8.0
Cairo, Ill.	7.8	8.6	10.0	9.0	7.5	6.5	5.3	4.9	5.8	6.6	7.8	7.8	7.3
Springfield, Ill.	9.6	10.4	10.8	10.3	8.5	7.3	6.1	6.6	8.0	8.1	9.4	9.3	8.7
Saint Louis, Mo.	10.5	10.5	11.8	10.9	9.8	8.9	7.8	7.5	8.7	9.5	10.7	10.4	9.8
Missouri Valley:													
Leavenworth, Kans.	7.2	7.7	9.3	9.2	7.6	6.9	5.4	5.3	6.5	6.6	7.2	6.8	7.1
Ogaha, Nebr.	9.2	9.5	10.6	10.9	9.3	8.0	7.0	6.9	7.8	8.7	9.6	8.9	8.9
Bennett, Fort, Dak.	6.4	6.3	8.0	9.6	9.7	8.4	7.8	8.9	8.7	7.9	7.0	6.2	7.9
Huron, Dak.	10.9	10.7	11.3	12.4	11.3	9.3	8.5	9.4	10.7	10.2	10.6	9.4	10.4
Yankton, Dak.	8.7	9.5	10.6	12.0	10.6	9.4	7.1	7.1	8.1	9.2	8.9	8.1	9.1
Extreme Northwest:													
Moorhead, Minn.	11.2	11.0	11.8	11.1	11.7	10.3	9.3	10.6	10.9	10.9	11.0	10.8	10.8
Saint Vincent, Minn.	9.7	9.6	9.7	8.8	9.6	8.3	7.8	7.4	8.5	9.3	10.1	9.7	9.0
Bismarck, Dak.	8.0	8.5	9.4	11.3	10.4	9.2	9.0	8.6	9.0	9.6	8.7	7.9	9.1
Bufo, Fort, Dak.	6.9	7.2	8.1	10.3	8.6	8.7	8.9	9.0	8.8	9.0	8.2	7.0	8.5
Northern Slope:													
Assinaboine, Fort, Mont.	11.0	11.8	9.7	10.4	8.7	9.8	10.3	8.7	9.0	10.5	11.9	11.0	10.3
Benton, Fort, Mont.	7.3	7.9	7.5	7.9	7.2	7.0	6.8	5.8	6.8	7.3	8.2	7.5	7.3
Custer, Fort, Mont.	6.7	7.2	7.8	8.6	8.0	6.9	7.0	6.9	6.6	6.9	6.4	6.6	7.1
Helena, Mont.	4.6	5.0	6.2	6.6	6.7	6.5	6.3	5.6	5.5	5.4	5.0	4.6	5.7
Maginnis, Fort, Mont.	15.2	12.0	9.5	10.4	10.3	10.2	9.9	9.4	9.5	11.9	13.6	12.5	11.2
Shaw, Fort, Mont.	11.3	12.4	10.3	9.4	9.1	8.3	7.6	6.6	7.9	9.9	11.0	11.2	9.6
Deadwood, Dak.	4.0	3.6	3.8	4.0	4.2	4.5	4.2	4.3	4.1	4.3	3.5	3.7	4.0
Cheyenne, Wyo.	12.9	12.4	12.5	11.8	10.5	9.2	8.9	8.1	9.9	10.6	11.0	11.2	10.6
North Platte, Nebr.	9.8	9.9	12.2	13.4	13.7	12.6	11.8	11.2	11.6	11.3	9.9	8.9	11.4
Middle Slope:													
Denver, Colo.	6.4	6.2	7.3	7.3	6.8	6.4	6.1	5.6	5.6	5.9	6.1	5.9	6.3
Pike's Peak, Colo.	23.0	23.3	25.3	21.3	21.5	19.0	12.7	12.0	10.1	21.1	19.7	22.2	20.1
West Las Animas, Colo.	8.0	8.8	9.6	11.7	11.3	8.0	7.5	7.9	8.9	8.4	6.2	6.9	8.6
Dodge City, Kans.	10.9	11.5	14.0	14.9	14.5	13.3	12.6	11.1	12.4	12.0	10.4	10.3	12.3
Elliott, Fort, Tex.	11.0	11.6	12.4	14.4	13.6	12.0	10.0	8.2	10.1	10.9	9.9	10.1	11.3
Southern Slope:													
Sill, Fort, Ind. T.	10.0	11.5	12.5	13.7	13.1	12.2	10.0	8.4	10.1	10.5	9.5	9.8	10.9
Concho, Fort, Tex.	8.3	9.4	9.8	11.1	11.1	9.9	8.9	7.3	7.8	8.0	7.9	8.7	9.0
Davis, Fort, Tex.	5.6	5.8	6.7	7.1	5.8	5.4	4.8	4.0	4.4	5.1	5.5	6.3	5.6
Stockton, Fort, Tex.	8.5	8.2	9.6	10.7	12.2	12.4	10.9	9.5	10.6	9.0	7.1	6.9	9.6
Southern Plateau:													
Santa Fé, N. Mex.	6.9	7.1	8.1	8.8	8.6	7.5	6.7	6.1	5.9	6.6	6.5	6.3	7.1
El Paso, Tex.	4.7	5.9	6.5	6.4	5.8	5.2	4.6	3.4	3.6	4.0	4.4	4.7	4.9
Apache, Fort, Ariz.	5.1	5.8	6.7	8.0	7.8	7.7	6.1	5.2	5.6	5.5	5.3	5.2	6.3
Grant, Fort, Ariz.	6.4	7.5	7.5	8.9	7.8	7.8	6.7	6.0	7.1	7.2	6.8	6.6	7.2
Prescott, Ariz.	5.0	6.2	7.2	8.6	7.9	7.4	5.8	4.8	5.3	5.7	4.6	5.1	6.1
Yuma, Ariz.	5.7	7.0	5.9	6.2	5.7	5.0	5.9	5.5	4.1	4.6	5.0	4.9	5.4
Middle Plateau:													
Winnemucca, Nev.	9.2	9.5	9.6	8.9	8.7	9.2	9.7	8.9	8.5	8.5	7.9	8.7	8.9
Salt Lake City, Utah.	4.0	4.4	5.9	6.4	6.5	6.2	5.7	5.7	5.5	4.9	3.9	3.9	3.2

Average hourly velocity of the wind, in miles, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Northern Plateau:													
Boisé City, Idaho	4.3	4.9	5.6	5.9	5.9	4.9	4.4	3.8	3.9	4.0	3.5	3.5	4.5
Lewiston, Idaho	3.4	3.1	2.4	2.3	2.2	2.9	2.2	2.7	2.3	2.1	2.3	2.9	2.9
Dayton, Wash	4.6	5.4	5.7	6.9	5.6	5.4	5.2	4.9	4.9	5.7	4.9	4.8	5.3
Spokane Falls, Wash.	3.7	4.5	4.7	6.1	5.5	5.6	5.3	4.5	4.1	4.3	3.5	3.7	4.6
North Pacific Coast:													
Canby, Fort, Wash	15.5	11.1	7.7	9.9	9.0	9.1	5.7	7.4	9.6	10.9	11.9	13.0	10.1
Olympia, Wash	4.1	4.4	4.1	4.1	3.9	3.6	3.5	2.8	3.1	3.3	3.6	4.3	3.8
Tatoosh Island, Wash	16.3	17.3	11.2	10.3	10.9	7.9	5.1	8.1	8.8	12.4	17.3	16.7	11.9
Portland, Oreg	5.9	5.2	5.1	4.8	4.8	4.7	4.7	4.1	4.3	4.1	4.4	4.7	4.7
Roseburg, Oreg	3.0	3.1	3.2	3.5	3.4	3.6	3.5	3.3	2.8	2.5	2.0	2.4	3.0
Middle Pacific Coast:													
Cape Mendocino, Cal.	15.6	18.0	14.3	21.0	16.9	17.6	22.0	19.7	16.5	15.8	16.4	15.5	17.4
Red Bluff, Cal	7.6	8.3	8.7	8.4	8.1	7.6	6.0	5.1	6.2	6.6	5.6	6.7	7.1
Sacramento, Cal	6.4	6.9	7.3	7.6	7.4	7.6	6.9	6.0	5.7	5.3	4.6	4.1	6.3
San Francisco, Cal	7.1	7.3	8.9	10.0	11.2	12.5	12.8	12.0	9.9	7.7	6.1	6.6	9.3
South Pacific Coast:													
Los Angeles, Cal	5.7	6.0	5.5	5.5	5.4	5.2	4.8	4.6	4.7	4.8	4.9	5.1	5.2
San Diego, Cal	5.2	6.1	6.5	6.8	6.7	6.4	6.4	6.1	6.0	5.5	5.0	5.1	6.0
Alaska Stations:													
Saint Michael's, Fort, Alaska	12.9	12.9	12.9	11.9	10.0	10.4	11.3	12.2	12.5	14.2	13.9	12.0	12.3
Sitka, Alaska	10.3	9.5	9.5	8.7	8.7	6.9	7.3	6.2	7.6	9.0	11.2	12.3	8.9
Unalakhta, Alaska	12.4	15.6	13.4	12.9	11.0	11.0	9.8	8.8	12.6	11.7	12.3	13.7	12.1
Behring's Island, Behring Sea	16.0	16.6	14.6	13.0	12.1	11.0	9.7	9.4	10.3	15.5	13.8	12.3	12.9

APPENDIX 48.

Average cloudiness, scale of 0 to 10, at stations of the Signal Service, United States Army, for each month and the year. (Computed from the commencement of observations at each, to and including December, 1884, from the three telegraphic observations.)

[The monthly average is obtained by dividing the sums of the amount of cloudiness recorded daily by the number of observations taken.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
New England:													
Eastport, Me.....	5.6	5.4	5.2	5.0	5.0	5.0	5.7	5.1	5.3	5.6	5.3	5.0	5.7
Portland, Me.....	4.9	4.7	5.6	5.5	5.4	4.9	4.8	4.4	4.7	5.1	5.1	5.3	5.0
Mount Washington, N. H.....	6.4	6.2	6.6	6.2	5.8	6.0	6.0	5.7	5.8	6.0	6.3	6.0	6.0
Boston, Mass.....	5.4	4.9	5.5	5.6	5.2	4.0	5.1	4.6	4.6	4.9	5.1	5.5	5.1
Block Island, R. I.....	5.4	4.7	5.0	4.6	4.6	3.0	4.1	4.3	4.5	4.8	4.9	5.6	4.7
New Haven, Conn.....	5.4	5.0	5.5	5.0	5.1	4.8	4.9	4.8	4.8	4.6	5.0	5.4	5.1
New London, Conn.....	5.1	4.7	5.2	5.2	4.6	4.5	4.7	4.5	4.7	4.6	4.9	5.1	4.8
Middle Atlantic States:													
Albany, N. Y.....	5.9	5.6	6.1	5.9	5.2	4.8	5.0	5.0	5.0	5.7	6.7	7.1	5.6
New York City.....	5.8	5.1	5.4	5.5	4.9	4.7	4.9	4.9	4.7	4.7	5.1	5.7	5.1
Philadelphia, Pa.....	5.0	5.3	5.5	5.4	4.5	4.7	4.8	4.7	4.5	4.6	4.9	5.9	5.0
Atlantic City, N. J.....	6.0	5.4	5.7	5.0	4.8	4.6	4.7	4.9	4.7	4.5	5.1	5.7	5.2
Barnegat City, N. J.....	5.8	5.5	5.7	5.0	4.9	4.8	4.9	4.7	4.8	4.7	5.0	5.6	5.2
Cape May, N. J.....	5.1	4.5	5.0	4.6	4.0	4.1	4.4	4.7	4.0	3.9	5.1	5.1	4.6
Sandy Hook, N. J.....	5.5	5.2	5.4	5.6	4.6	4.5	4.7	4.6	4.9	4.6	4.9	5.6	5.0
Delaware Breakwater, Del.....	6.4	5.4	5.6	5.3	4.4	5.0	4.8	4.7	4.3	4.7	4.9	5.6	5.1
Baltimore, Md.....	5.6	5.3	5.4	5.4	4.7	4.9	4.9	5.0	4.6	4.5	4.8	5.3	5.0
Washington City.....	6.0	5.6	5.5	5.4	4.4	5.0	4.6	4.9	4.7	4.7	5.1	5.7	5.2
Cape Henry, Va.....	5.9	5.1	5.1	5.2	4.4	4.5	4.9	5.2	4.5	4.3	5.0	5.5	5.0
Chincoteague, Va.....	6.4	5.0	4.8	5.3	4.2	4.7	4.9	4.9	3.9	4.0	4.5	5.3	4.8
Lyndburg, Va.....	5.2	4.9	4.8	4.9	4.3	4.4	4.6	5.0	4.1	3.9	4.4	4.8	4.6
Norfolk, Va.....	5.4	5.3	5.0	5.2	4.0	4.0	4.9	5.1	4.7	4.2	4.7	5.0	4.9
South Atlantic States:													
Charlotte, N. C.....	6.4	5.3	5.2	5.4	4.9	5.2	5.1	5.1	4.5	4.8	4.6	5.2	5.2
Hatteras, N. C.....	6.0	5.0	5.0	5.1	4.3	4.8	4.0	5.4	4.5	4.7	5.4	5.2	5.0
Kitty Hawk, N. C.....	5.3	4.8	4.8	5.0	4.2	4.3	4.0	5.3	4.6	4.5	4.8	5.1	4.8
Macon, Fort, N. C.....	6.2	5.0	5.0	5.5	4.5	5.5	4.8	5.0	4.6	4.4	4.7	5.2	5.1
Smithville, N. C.....	5.4	4.8	4.5	4.6	3.8	4.3	4.4	4.0	4.5	4.2	4.6	4.7	4.6
Wilmington, N. C.....	5.4	5.2	4.8	4.6	4.5	4.9	5.0	5.4	5.0	4.1	4.8	5.0	4.9
Charleston, S. C.....	4.0	4.6	4.2	4.2	4.1	4.7	4.6	5.0	4.7	3.0	4.2	4.6	4.5
Augusta, Ga.....	5.0	4.4	4.0	4.5	4.0	4.0	4.5	5.0	4.3	3.4	4.7	4.8	4.6
Savannah, Ga.....	5.1	4.8	4.3	4.5	4.3	4.9	4.7	5.2	4.8	4.1	4.7	4.6	4.7
Jacksonville, Fla.....	4.7	4.0	3.9	4.1	4.0	4.0	4.1	4.3	4.0	4.3	4.7	4.6	4.3
Florida Peninsula:													
Cedar Key, Fla.....	4.4	3.7	3.5	3.4	3.5	4.0	4.2	4.5	3.1	2.9	3.4	4.0	3.8
Key West, Fla.....	4.2	3.5	2.8	3.0	4.2	4.8	4.8	5.0	3.2	4.6	4.0	4.0	4.2
Sanford, Fla.....	4.5	3.7	4.0	3.8	4.0	4.0	4.0	4.3	5.2	4.7	4.9	3.7	4.2
Eastern Gulf States:													
Atlanta, Ga.....	6.3	5.4	4.9	4.9	4.5	5.2	4.8	5.4	4.1	4.6	4.8	5.4	5.1
Pensacola, Fla.....	5.7	5.0	4.4	4.9	4.2	4.7	4.7	4.7	3.6	4.1	4.4	5.3	4.7
Mobile, Ala.....	5.4	5.0	4.7	4.8	4.2	4.8	4.9	4.8	4.4	4.0	4.5	5.1	4.7
Montgomery, Ala.....	6.2	5.5	4.8	4.9	4.4	5.1	4.8	4.8	4.4	4.3	4.8	5.6	4.9
Vicksburg, Miss.....	5.8	5.5	4.9	4.5	4.3	4.0	4.2	4.0	4.4	3.8	4.8	5.4	4.6
New Orleans, La.....	5.3	5.0	4.0	5.0	4.0	4.0	5.0	4.7	4.5	4.1	4.8	5.5	4.9
Western Gulf States:													
Shreveport, La.....	5.9	5.6	5.2	5.0	4.8	4.5	4.2	3.6	3.7	3.9	4.7	5.5	4.7
Fort Smith, Ark.....	5.1	6.4	5.2	5.3	4.3	3.9	4.2	4.0	3.5	4.6	4.5	5.1	4.7
Little Rock, Ark.....	5.7	5.9	5.2	4.5	4.6	3.5	4.0	3.4	3.4	3.9	4.7	5.2	4.5
Galveston, Tex.....	5.5	5.4	5.2	4.9	4.8	4.1	3.9	4.1	4.0	3.8	4.7	5.4	4.6
Indianola, Tex.....	5.4	5.7	5.6	5.0	5.0	4.0	3.7	3.8	3.9	3.7	4.8	5.6	4.6
Palestine, Tex.....	5.7	5.9	5.4	5.5	4.9	4.2	4.1	3.5	3.7	4.4	4.8	5.3	4.8
Rio Grande Valley:													
Brownsville, Tex.....	5.8	5.6	5.5	5.3	4.6	3.9	3.8	4.0	4.7	4.2	5.5	5.8	4.9
Rio Grande City, Tex.....	5.4	4.5	4.8	4.1	4.0	3.5	3.0	4.3	3.8	4.2	4.5	4.8	4.1
Ohio Valley and Tennessee:													
Chattanooga, Tenn.....	6.3	5.9	5.3	5.1	4.3	4.4	4.2	4.5	4.2	4.7	4.8	5.9	5.0
Knoxville, Tenn.....	6.4	5.7	5.3	5.0	4.4	3.0	4.0	4.5	4.0	3.9	5.2	5.4	5.0

Average cloudiness, scale of 0 to 10, at stations of the Signal Service, United States Army,
etc.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Ohio Valley and Tennessee—Continued:													
Memphis, Tenn.	5.9	5.9	5.1	5.0	4.7	4.3	4.4	4.0	3.9	4.0	5.3	5.8	4.8
Nashville, Tenn.	6.5	6.1	5.7	5.5	5.0	5.2	4.9	4.3	4.4	4.2	5.4	6.3	5.4
Louisville, Ky.	6.2	6.0	5.9	5.4	4.7	5.4	4.7	3.9	4.3	4.1	5.6	6.3	5.2
Indianapolis, Ind.	6.3	5.9	6.2	5.5	4.9	5.3	4.6	4.0	3.9	4.5	5.7	6.4	5.3
Cincinnati, Ohio.	6.4	6.1	5.9	5.3	4.4	5.1	4.5	4.2	4.2	4.4	5.7	6.5	5.3
Columbus, Ohio.	7.0	6.5	6.5	5.4	4.5	5.3	4.4	4.2	4.3	4.8	5.6	7.2	5.5
Pittsburg, Pa.	7.1	6.6	6.5	5.6	4.9	4.9	4.9	4.4	5.0	5.4	6.5	7.1	5.8
Lower Lakes:													
Buffalo, N. Y.	7.7	6.5	6.3	5.6	5.2	4.9	4.7	4.4	5.1	6.0	7.4	8.2	6.0
Oswego, N. Y.	8.0	7.3	6.8	5.8	5.1	4.9	4.8	4.6	5.3	6.4	8.1	8.7	6.3
Rochester, N. Y.	7.9	6.9	6.7	5.6	4.8	4.7	4.6	4.3	5.0	6.0	7.7	8.4	6.0
Erie, Pa.	7.7	6.6	6.5	5.6	4.6	4.6	4.4	4.2	5.0	6.0	7.7	8.3	5.9
Cleveland, Ohio.	7.4	6.5	6.6	5.4	4.7	4.6	4.5	4.0	4.9	5.6	7.8	7.6	5.8
Sandusky, Ohio.	7.6	6.4	6.3	5.4	4.6	4.7	4.2	4.1	4.4	5.2	6.5	7.6	5.5
Toledo, Ohio.	7.0	6.4	6.4	5.6	4.9	5.1	4.7	4.3	4.6	5.5	6.5	7.3	5.7
Detroit, Mich.	7.0	6.1	6.3	5.4	5.0	5.0	4.3	4.0	4.4	5.1	6.2	6.9	5.5
Upper Lakes:													
Alpena, Mich.	7.1	6.2	5.8	4.8	4.9	4.6	4.3	4.1	5.2	6.0	7.2	7.8	5.7
Escanaba, Mich.	6.3	5.8	5.5	5.1	5.3	4.9	4.5	4.8	5.3	6.4	7.1	6.9	5.7
Grand Haven, Mich.	7.9	6.5	6.1	5.0	4.4	4.5	3.7	3.6	4.4	5.4	7.3	8.1	5.6
MacKinnaw City, Mich.	7.0	6.2	5.0	5.2	5.8	5.1	5.4	4.0	5.0	6.4	7.7	8.8	6.0
Marquette, Mich.	6.7	6.1	5.4	5.1	4.8	4.8	4.4	4.3	5.8	6.6	7.1	7.3	5.7
Port Huron, Mich.	7.1	6.4	6.5	5.6	5.2	4.9	4.6	4.6	4.9	6.1	6.8	7.9	5.9
Chicago, Ill.	5.7	5.5	5.8	5.3	4.6	5.1	4.0	3.7	4.3	5.2	5.9	6.0	5.1
Milwaukee, Wis.	6.0	5.8	6.0	5.6	5.1	5.2	4.5	4.5	4.9	5.5	6.3	6.3	5.5
Duluth, Minn.	5.1	5.5	4.9	4.2	5.1	5.3	4.7	4.9	5.3	6.1	6.2	5.8	5.4
Upper Mississippi Valley:													
Saint Paul, Minn.	4.9	4.9	5.2	5.3	5.2	5.0	4.2	4.6	4.8	5.1	5.8	5.1	5.0
La Crosse, Wis.	4.8	4.8	5.3	4.6	5.0	4.9	4.2	4.3	4.5	5.2	5.8	5.4	4.9
Davenport, Iowa.	5.5	5.5	5.7	5.4	5.1	5.2	4.4	4.3	4.4	5.0	5.8	6.1	5.2
Des Moines, Iowa.	4.8	5.0	5.4	5.7	5.8	5.8	4.6	4.5	4.4	4.8	4.7	6.0	5.2
Dubuque, Iowa.	4.7	5.4	5.9	5.2	5.5	5.7	4.6	4.4	5.0	5.5	6.0	6.2	5.4
Keokuk, Iowa.	5.6	4.9	5.5	5.1	5.2	5.3	4.4	3.8	3.9	4.5	5.4	5.8	5.0
Quadra, Ill.	6.1	5.7	5.4	5.3	4.9	5.0	4.4	3.8	4.1	4.3	5.6	6.3	5.1
Springfield, Ill.	5.7	5.2	5.5	5.3	4.7	5.5	3.9	3.6	3.8	4.5	4.9	6.3	4.9
Saint Louis, Mo.	5.4	5.4	5.4	5.2	5.0	5.1	4.4	3.7	3.7	4.0	5.3	6.0	4.9
Missouri Valley:													
Leavenworth, Kans.	5.0	5.0	5.1	5.3	5.5	4.6	4.3	3.7	4.0	4.2	4.5	5.3	4.7
Omaha, Nebr.	5.0	4.9	5.4	5.4	5.8	5.1	4.4	4.2	4.0	4.2	4.5	5.2	4.8
Bennett, Fort, Dak.	4.7	4.8	5.4	5.8	5.5	4.6	4.8	4.0	4.1	4.9	4.5	5.1	4.9
Huron, Dak.	4.4	4.7	5.9	5.6	5.2	4.8	4.5	4.0	4.2	5.3	4.4	4.7	4.7
Yankton, Dak.	4.0	4.9	5.2	4.9	5.5	4.6	4.1	3.8	3.8	4.3	4.3	4.8	4.5
Extreme Northwest:													
Moorhead, Minn.	4.4	5.0	5.4	4.8	5.1	4.9	4.7	4.2	4.7	5.6	5.7	5.0	5.0
Saint Vincent, Minn.	4.4	4.6	4.6	4.5	4.4	4.5	4.6	4.0	4.5	5.8	5.6	4.2	4.6
Bismarck, Dak.	4.3	5.0	5.6	5.6	5.6	4.7	4.1	3.4	3.8	4.8	5.0	5.2	4.8
Buford, Fort, Dak.	5.2	4.6	5.1	4.8	4.7	4.8	4.1	3.4	3.9	5.4	5.3	4.9	4.8
Northern Slope:													
Assinaboine, Fort, Mont.	5.4	4.8	4.8	4.3	4.3	3.9	3.4	3.2	3.8	4.9	6.0	4.9	4.2
Beaten, Fort, Mont.	6.0	5.5	4.9	5.0	4.7	4.4	3.3	2.7	4.1	5.6	5.4	5.5	4.8
Custer, Fort, Mont.	5.3	5.6	4.8	5.2	5.2	4.4	3.8	3.0	3.5	4.9	4.6	5.8	4.7
Helena, Mont.	6.4	5.3	4.3	4.4	4.9	4.3	3.2	2.9	3.3	4.7	4.6	5.1	4.5
Maginnia, Fort, Mont.	6.3	5.6	5.8	5.4	5.8	4.8	3.6	3.0	4.0	4.8	4.7	5.3	5.0
Poplar River, Mont.	4.0	4.2	4.3	3.8	3.1	2.7	2.3	2.5	3.2	4.2	3.9	4.3	4.6
Shaw, Fort, Mont.	5.4	4.7	4.4	4.6	4.7	4.2	3.3	2.9	3.7	5.6	4.4	4.9	4.4
Deadwood, Dak.	4.2	4.6	5.0	5.3	5.3	4.6	3.4	3.2	3.8	3.9	3.5	4.7	4.3
Cheyenne, Wyo.	3.5	3.4	4.2	4.9	5.2	4.8	3.9	3.7	3.2	3.7	3.5	3.8	3.9
North Platte, Nebr.	4.0	4.2	5.1	5.0	5.7	4.4	4.1	3.8	3.7	4.2	4.2	4.6	4.4
Middle Slope:													
Denver, Colo.	3.2	3.4	4.1	4.8	5.0	3.7	4.1	4.1	3.1	3.4	3.2	3.4	3.8
Pike's Peak, Colo.	3.7	4.2	4.5	4.7	4.6	3.8	4.8	4.7	3.6	3.6	3.4	3.7	4.1
West Las Animas, Colo.	3.8	3.1	3.7	4.7	5.4	4.0	4.4	3.9	3.1	3.5	2.7	4.4	4.1
Dodge City, Kans.	4.1	4.0	4.1	4.0	4.9	3.5	4.1	3.4	3.1	3.3	3.7	4.1	3.9
Elliott, Fort, Tex.	3.1	3.1	3.5	3.3	4.4	3.3	3.8	3.4	3.2	3.7	3.1	3.4	3.4
Southern Slope:													
Sill, Fort, Ind. T.	4.6	4.8	4.2	3.6	4.6	3.5	3.7	3.2	3.6	3.7	4.9	4.7	4.0
Comcho, Fort, Tex.	3.9	4.2	3.6	3.1	4.0	3.5	3.5	3.6	4.1	4.4	3.9	3.9	3.7
Davis, Fort, Tex.	3.8	3.4	3.3	2.5	2.8	2.9	3.5	3.6	3.5	3.5	3.4	3.3	3.1
Stockton, Fort, Tex.	2.9	3.5	3.1	2.9	3.3	3.0	3.2	3.1	2.9	2.9	3.0	3.3	3.1
Southern Plateau:													
Santa Fe, N. Mex.	3.5	3.8	3.8	4.0	3.9	3.4	5.1	5.0	3.1	2.5	3.1	3.3	3.7
El Paso, Tex.	3.2	3.3	2.8	2.5	2.5	3.0	3.8	3.5	3.0	3.1	3.3	3.3	3.1
Apache, Fort, Ariz.	3.4	4.0	3.5	3.0	1.8	2.0	4.8	5.0	2.3	2.2	2.1	3.0	3.1
Grant, Fort, Ariz.	3.5	3.9	3.5	2.3	2.0	2.2	5.1	4.8	2.0	1.8	2.1	3.1	3.1

Average cloudiness, scale of 0 to 10, at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean annual.
Southern Plateau—Continued:													
Prescott, Ariz.....	2.9	2.8	3.1	2.7	1.8	1.4	3.1	3.3	1.7	1.7	1.6	2.7	2.4
Thomas, Camp, Ariz.....	3.4	4.0	3.5	2.3	1.8	2.1	4.0	4.2	2.3	2.3	2.2	2.9	3.0
Yuma, Ariz.....	2.3	2.2	2.1	1.6	1.0	0.8	1.5	2.1	1.0	1.4	1.7	1.9	1.6
Middle Plateau:													
Winnemucca, Nev.....	4.5	4.6	4.2	4.6	4.8	3.3	1.7	1.4	2.0	2.6	3.4	4.4	3.5
Salt Lake City, Utah.....	5.3	5.3	5.4	5.3	4.6	3.1	2.9	3.0	2.6	4.0	4.5	5.7	4.3
Northern Plateau:													
Boisé City, Idaho.....	5.7	6.1	5.3	5.2	5.0	4.1	2.5	2.0	3.1	4.5	4.5	6.1	4.6
Lewiston, Idaho.....	6.9	5.8	4.9	4.8	4.3	4.5	2.8	2.1	3.1	5.0	5.4	6.5	4.7
Dayton, Wash.....	6.4	5.6	4.9	5.2	4.5	4.5	2.9	3.1	3.6	5.2	5.3	7.0	4.7
Spokane Falls, Wash.....	5.9	6.0	4.9	5.0	4.6	5.0	3.8	2.2	3.7	6.0	6.1	4.2	4.7
North Pacific Coast:													
Canby, Fort, Wash.....	5.7	3.9	4.7	5.2	5.0	6.7	7.0	4.8	4.6	5.4	5.6	5.8	5.2
Olympia, Wash.....	7.8	7.2	6.6	6.7	6.2	5.9	4.6	4.5	5.2	6.8	7.4	7.8	6.4
Tatoosh Island, Wash.....	6.7	5.5	6.3	6.0	5.1	6.8	7.0	4.3	6.7	5.8	7.3	6.7	6.1
Portland, Oreg.....	7.1	7.2	7.1	6.6	6.5	5.8	3.9	3.8	4.3	5.8	6.7	7.2	6.0
Roseburg, Oreg.....	7.0	6.6	5.7	6.0	5.0	4.6	3.0	2.2	3.2	5.5	6.1	6.7	5.1
Middle Pacific Coast:													
Cape Mendocino, Cal.....	4.9	3.4	5.0	6.0	4.1	3.4	2.5	1.4	2.3	3.6	3.9	4.6	3.9
Red Bluff, Cal.....	4.4	4.5	4.0	4.1	3.5	1.7	1.1	0.6	1.1	2.1	2.9	4.3	2.6
Sacramento, Cal.....	4.2	4.3	3.7	3.6	2.7	1.5	0.5	0.4	0.8	1.9	1.5	2.3	2.5
San Francisco, Cal.....	4.7	4.7	4.6	4.1	3.7	4.0	4.7	4.2	3.4	3.2	3.6	4.5	4.1
South Pacific Coast:													
Los Angeles, Cal.....	3.1	4.0	4.5	4.7	4.2	4.5	3.0	2.6	2.4	2.6	2.3	3.2	3.4
San Diego, Cal.....	4.1	4.4	4.8	4.5	5.3	5.0	4.6	4.1	3.7	3.8	3.5	3.6	4.3
Alaska Stations:													
Saint Michael's, Fort, Alaska.....	6.3	4.4	5.7	6.7	7.2	7.2	7.7	8.2	8.2	7.8	6.2	5.2	6.7
Sitka, Alaska.....	7.2	5.7	6.1	6.0	7.2	7.6	8.3	6.6	6.8	6.7	7.6	6.7	6.9
Unalashka, Alaska.....	8.7	8.9	7.6	8.7	8.6	8.6	7.4	7.9	8.2	8.5	8.4	8.2	8.0

APPENDIX 49.

Average number of clear, fair, and cloudy days, at stations of the Signal Service, United at each to and including December, 1884,

(Cloudiness is recorded on a scale of 0 to 10, each observation. Clear

Stations.	January.			February.			March.			April.			May.			June.		
	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
New England:																		
Eastport, Me.	7.2	11.8	12.0	6.7	11.2	10.5	6.2	10.4	14.4	6.9	8.7	14.4	6.2	11.1	13.7	5.9	11.3	12.8
Portland, Me.	9.6	12.2	9.2	9.1	11.5	7.6	7.2	11.8	12.0	7.6	11.2	11.2	7.9	12.2	10.9	8.1	13.7	8.2
Mt. Washington, N. H.	4.9	10.9	15.2	6.1	9.1	13.2	6.0	9.8	15.2	7.0	8.8	14.2	7.3	12.2	11.5	6.8	10.5	12.7
Boston, Mass.	7.8	10.3	12.9	8.7	9.0	10.6	8.5	9.0	12.9	6.9	11.0	11.5	7.4	14.5	9.1	8.4	11.7	9.9
Block Island, R. I.	8.8	13.2	9.0	9.0	13.2	6.0	11.5	12.0	7.5	11.0	11.8	7.2	11.0	14.0	6.0	13.3	12.2	4.7
New Haven, Conn.	8.2	12.0	10.8	8.1	10.7	9.5	7.0	12.3	11.1	6.7	12.1	11.2	9.2	13.2	8.6	9.0	12.8	8.2
New London, Conn.	8.8	13.8	8.9	10.4	10.6	7.3	8.9	12.6	9.5	7.9	13.1	9.0	10.6	13.1	7.3	10.4	13.2	6.4
Middle Atlantic States:																		
Albany, N. Y.	5.8	12.6	12.0	7.4	10.4	10.4	6.0	13.0	12.0	7.8	11.3	10.9	9.3	13.3	8.4	8.7	12.9	8.4
New York City	7.4	12.1	11.5	7.7	10.9	9.7	7.3	13.6	10.1	7.7	12.3	10.0	9.4	13.3	8.3	8.1	14.8	7.1
Philadelphia, Pa.	6.4	11.9	12.7	7.4	10.6	10.3	7.4	11.4	12.2	7.8	11.6	10.6	11.1	11.0	8.9	8.8	14.6	7.6
Atlantic City, N. J.	7.6	10.9	12.5	8.5	10.5	9.2	8.9	12.0	10.1	8.9	10.6	10.5	9.8	13.6	7.6	10.7	12.7	8.6
Barnegat City, N. J.	6.8	12.2	12.0	7.7	11.0	9.5	6.5	14.1	10.4	7.6	11.0	11.4	8.6	15.7	6.7	7.8	16.2	6.0
Cape May, N. J.	10.7	9.4	10.9	10.4	8.0	9.8	10.1	9.6	11.3	10.3	8.6	11.1	14.3	9.4	7.3	13.1	9.0	7.9
Sandy Hook, N. J.	7.9	11.9	11.2	8.7	11.4	8.2	7.3	14.6	9.1	7.4	12.0	10.0	9.9	14.1	7.0	9.1	13.8	7.1
Delaware Brkwater:																		
Del.	4.5	12.5	13.7	7.8	11.0	9.6	6.8	14.2	10.0	8.8	12.6	8.6	12.4	12.6	6.0	8.2	14.6	7.2
Baltimore, Md.	7.1	13.2	10.7	7.5	12.6	8.1	8.6	11.7	10.7	7.5	12.7	9.8	10.6	12.2	8.2	7.6	15.2	7.2
Washington City	5.9	11.9	13.2	6.6	11.9	9.7	7.4	12.5	11.1	8.1	12.1	9.8	10.8	11.9	8.3	7.9	15.4	6.7
Cape Henry, Va.	7.2	11.1	12.2	8.5	11.4	8.4	8.6	12.6	9.8	10.0	10.2	8.3	12.0	12.2	6.8	10.5	13.1	6.4
Chincoteague, Va.	5.0	13.8	12.2	6.5	13.5	6.2	9.8	13.5	7.7	8.2	13.6	8.2	10.8	12.6	7.6	8.0	17.2	8.8
Lynchburg, Va.	8.8	11.6	10.0	9.2	11.2	8.0	11.5	10.9	8.6	9.9	11.5	8.6	12.5	11.6	6.9	9.6	11.9	8.8
Norfolk, Va.	8.8	11.1	11.1	8.4	11.0	8.8	9.9	11.0	10.1	9.6	10.5	8.6	12.0	12.4	7.6	8.6	12.7	7.7
South Atlantic States:																		
Charlotte, N. C.	5.8	10.5	14.7	8.7	8.3	11.3	8.7	13.5	8.8	8.3	12.3	9.4	9.8	13.2	8.0	7.8	12.8	8.4
Hatteras, N. C.	5.8	13.7	11.5	7.8	12.5	8.0	9.5	10.5	11.0	7.8	14.0	8.2	9.8	14.7	6.5	7.0	15.8	4.5
Kitty Hawk, N. C.	9.4	12.0	9.6	9.4	10.3	8.0	10.4	11.8	8.8	9.4	13.2	7.4	12.7	12.4	5.9	11.2	13.1	5.7
Macon, Fort, N. C.	4.6	14.2	12.2	8.0	11.5	8.8	9.5	12.2	9.8	8.8	10.0	11.2	9.0	16.2	5.8	5.2	16.3	8.5
Smithville, N. C.	7.3	12.8	11.4	9.2	9.5	9.6	10.9	10.5	9.6	9.6	11.7	8.7	12.2	13.2	8.4	10.6	13.1	6.3
Wilmington, N. C.	8.8	10.8	11.4	8.7	8.3	11.3	11.4	9.7	9.9	11.4	10.6	8.0	11.1	12.6	7.3	9.5	12.6	7.9
Charleston, S. C.	9.5	10.5	11.0	11.2	8.4	7.6	12.6	10.7	7.7	11.9	11.3	6.8	11.4	13.9	5.9	9.0	14.4	6.0
Augusta, Ga.	10.6	9.5	10.9	8.1	11.7	8.4	12.0	10.2	8.8	10.8	11.5	7.7	12.4	13.0	5.6	8.1	15.0	6.9
Savannah, Ga.	9.0	10.8	11.2	9.3	10.4	8.6	11.5	11.2	8.8	11.5	10.6	7.9	11.0	13.9	6.1	7.3	15.4	7.3
Jacksonville, Fla.	9.1	12.8	9.1	9.8	10.5	8.0	12.7	12.8	8.5	12.2	11.7	6.1	11.0	14.7	5.5	8.3	14.5	7.2
Florida Peninsula:																		
Cedar Keys, Fla.	9.8	14.0	7.2	14.8	8.4	5.2	13.2	13.8	4.0	15.8	10.2	4.0	14.6	12.4	4.0	7.2	18.8	4.0
Key West, Fla.	12.1	13.9	5.0	12.1	12.4	3.9	16.1	12.3	2.6	14.5	12.9	2.6	9.5	17.1	4.4	6.2	18.7	5.1
Sanford, Fla.	11.0	11.0	9.0	16.0	10.0	8.0	13.0	14.0	4.0	12.0	15.0	4.0	12.0	15.0	4.0	3.0	20.0	6.5
Eastern Gulf States:																		
Atlanta, Ga.	5.8	11.7	13.5	8.8	8.8	10.7	11.5	10.3	9.2	9.8	12.2	8.0	11.5	12.5	7.0	7.1	14.2	8.7
Pensacola, Fla.	5.8	14.4	10.8	9.8	10.2	8.4	12.0	10.8	8.2	10.2	12.0	7.8	12.2	12.0	6.0	10.2	14.0	5.8
Mobile, Ala.	8.0	11.8	11.2	8.6	10.8	8.8	11.3	10.3	9.4	10.1	11.0	8.9	12.2	12.8	6.0	9.5	13.9	6.0
Montgomery, Ala.	6.0	11.1	13.9	7.3	10.5	10.4	11.2	10.0	9.8	10.3	10.4	9.3	11.2	14.3	5.5	7.3	14.3	8.4
Vicksburg, Miss.	6.8	10.5	10.8	7.7	9.8	10.8	10.3	10.5	10.2	10.5	11.9	7.6	12.2	11.9	6.9	10.0	15.2	4.8
New Orleans, La.	7.8	12.2	10.9	8.5	10.6	9.2	9.9	10.7	10.4	10.5	10.3	9.2	10.1	14.3	6.6	7.9	16.2	5.9
Western Gulf States:																		
Shreveport, La.	7.8	10.4	12.8	8.2	8.5	10.6	8.6	12.4	10.0	9.5	12.6	7.9	8.9	14.8	7.9	9.2	16.1	4.7
Fort Smith, Ark.	10.8	10.4	9.8	8.5	14.5	9.0	13.0	10.0	9.0	10.0	8.5	11.7	10.0	14.0	7.0	12.8	14.0	3.7
Little Rock, Ark.	7.6	10.6	12.8	8.4	6.8	13.2	11.0	9.2	10.8	11.4	11.8	6.8	11.0	12.8	7.2	13.0	14.0	2.4
Galveston, Tex.	8.3	9.5	13.2	7.4	10.7	10.2	8.3	12.3	10.4	9.8	10.3	9.9	9.6	14.6	6.8	12.0	13.4	4.6
Indianola, Tex.	4.0	12.5	10.0	6.8	11.2	10.7	7.0	14.2	9.8	8.9	12.4	8.7	8.1	15.1	7.8	8.8	16.8	3.4
Palestine, Tex.	10.0	13.5	7.5	7.5	8.5	12.5	7.0	13.0	11.0	7.0	10.5	7.8	7.7	16.0	9.0	9.7	18.0	2.3
Rio Grande Valley:																		
Brownsville, Tex.	8.1	9.4	13.5	7.6	8.5	12.1	7.5	10.5	13.0	6.8	13.2	10.0	9.2	15.0	6.8	12.9	13.8	3.3
Rio Grande City, Tex.	9.8	10.2	11.0	11.0	9.0	8.2	11.3	11.4	8.8	14.0	10.0	6.0	9.4	15.9	5.7	14.7	11.0	4.3

APPENDIX 49.

States Army, for each month and the year. (Computed from the commencement of observations from the three telegraphic observations.)

days comprise from 0 to 8; fair, 9 to 22, and cloudy, 23 to 30, inclusive.

July.			August.			September.			October.			November.			December.			Annual.		
Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
5.214.4	11.4	8.6	11.5	10.9	8.2	10.9	10.9	7.7	11.2	12.1	5.4	11.1	18.5	5.8	11.7	18.5	81.8	188.1	145.4	
8.514.5	8.0	11.2	12.5	7.3	10.4	11.1	8.5	8.8	11.6	10.6	9.1	10.8	10.1	8.6	18.1	9.3	102.9	148.4	113.6	
6.211.4	13.4	7.9	12.5	10.6	7.3	10.4	12.3	6.8	9.5	14.7	5.7	8.1	16.2	6.4	9.0	15.6	79.2	122.8	163.8	
7.213.9	9.9	11.1	11.3	8.6	10.6	10.1	9.5	9.8	11.4	9.8	8.8	10.2	11.0	7.3	11.2	12.5	103.0	124.0	128.3	
13.213.3	4.5	10.5	16.3	4.2	11.2	12.4	6.4	10.6	12.0	8.4	10.0	12.0	8.0	7.4	14.2	9.4	122.5	161.0	81.8	
8.514.8	7.7	10.4	12.9	7.7	10.7	10.5	8.8	10.7	12.2	8.1	10.3	11.2	8.5	8.8	12.0	10.2	136.2	140.6	110.5	
9.115.0	6.9	10.3	12.8	7.9	11.2	10.5	8.3	10.9	12.6	7.5	10.5	10.8	8.7	9.2	12.9	8.9	119.2	150.2	95.9	
9.314.3	7.4	12.1	12.4	6.5	9.4	12.0	8.6	7.9	12.6	10.5	4.6	11.2	14.2	3.9	11.4	15.7	92.1	147.3	125.9	
7.615.7	7.7	9.8	12.4	8.8	9.6	11.7	8.7	10.3	12.7	8.0	9.0	11.1	9.9	5.9	13.9	12.1	90.8	153.6	111.9	
9.413.7	7.9	10.6	10.1	10.3	11.2	10.6	8.2	11.2	11.8	8.0	9.1	10.9	10.0	6.0	12.9	12.0	106.5	140.0	118.8	
10.713.5	6.8	11.1	10.4	9.5	11.7	10.1	8.2	12.8	10.2	8.0	10.4	9.9	9.7	9.4	11.8	10.3	120.3	135.9	109.1	
8.715.6	6.7	9.6	14.1	7.3	10.0	12.7	7.3	10.8	12.2	8.0	10.3	10.1	9.0	7.9	12.6	10.5	102.5	157.4	105.4	
12.311.6	7.1	12.6	9.0	9.4	13.3	8.4	8.3	14.7	8.2	8.1	10.2	8.4	11.4	9.3	9.5	12.2	140.4	109.2	115.7	
8.515.3	7.2	10.3	12.5	8.0	10.1	11.8	8.1	10.8	12.5	7.7	9.7	11.2	9.1	6.9	13.6	10.5	103.8	155.9	104.0	
10.014.6	6.4	9.8	14.2	7.0	12.4	11.2	6.4	12.4	10.8	7.8	10.6	9.8	9.6	6.0	15.6	9.4	105.5	150.8	100.0	
9.114.4	7.5	10.0	12.2	8.8	11.1	11.2	7.7	11.5	11.8	7.7	10.2	10.7	9.1	8.1	13.3	9.6	109.1	151.1	105.1	
9.014.3	7.7	9.2	13.4	8.4	11.3	10.4	8.3	11.4	11.4	8.2	8.8	11.8	9.4	7.7	12.6	10.7	104.1	149.5	111.7	
9.013.0	7.0	8.8	14.0	8.2	11.4	10.4	8.2	13.3	10.2	7.5	10.3	9.4	10.3	7.7	12.1	11.2	117.2	141.6	105.5	
8.216.8	6.0	9.6	13.2	8.2	12.6	12.0	5.4	10.8	12.4	7.8	12.0	10.0	8.0	8.3	13.4	9.3	111.4	166.5	87.4	
10.114.4	6.5	10.1	12.2	8.7	12.5	11.1	6.4	13.2	9.4	6.4	11.5	11.5	7.0	10.1	11.8	9.1	131.6	139.4	94.3	
8.714.4	7.9	9.1	13.4	8.5	11.3	10.2	8.5	13.9	9.9	7.2	11.4	9.6	9.0	9.6	12.0	9.4	121.8	187.6	106.4	
7.516.5	7.0	9.0	13.2	8.8	10.8	11.3	7.9	11.5	10.0	9.5	12.7	7.6	9.7	9.1	11.9	10.0	108.5	143.8	113.5	
8.515.2	7.3	7.8	12.0	11.2	9.5	12.5	8.0	10.4	11.4	7.0	8.2	14.0	7.8	6.2	14.8	10.0	97.8	160.5	101.0	
9.215.8	6.0	8.0	15.2	7.8	11.7	10.9	7.4	12.0	11.4	7.6	10.7	10.9	8.4	8.5	13.4	9.1	125.5	147.8	92.0	
8.812.2	9.0	7.0	14.2	9.8	10.8	12.0	7.2	10.3	14.2	6.5	10.5	12.3	7.2	7.0	15.8	8.2	100.4	161.3	103.6	
9.614.6	6.8	8.4	13.4	3.2	11.3	9.9	8.8	12.5	10.2	8.3	10.0	11.5	8.5	10.0	11.6	9.4	121.5	141.6	102.2	
8.414.3	7.3	8.6	13.1	9.3	9.8	10.8	9.4	13.8	9.7	7.6	11.4	9.3	9.5	10.5	11.4	9.1	124.4	133.2	107.7	
10.015.0	6.0	8.7	14.9	7.4	10.6	10.7	6.9	14.2	10.1	6.7	11.7	10.4	7.9	11.4	10.8	8.8	132.5	142.8	90.5	
10.314.6	6.1	8.2	15.5	7.3	10.8	12.5	8.7	14.5	9.8	6.4	10.7	9.9	9.4	10.1	11.0	9.9	126.8	144.6	93.9	
9.116.0	5.9	7.2	15.5	8.3	9.0	11.7	6.9	14.3	11.6	7.1	10.3	11.1	8.6	10.6	10.7	9.7	118.2	149.1	98.0	
9.916.2	4.9	9.3	16.6	5.1	9.5	12.8	8.2	11.6	11.4	8.0	9.7	11.1	9.2	10.6	11.8	8.6	124.0	156.1	85.2	
11.415.0	4.6	11.6	15.0	4.4	16.2	12.2	1.6	13.4	8.2	3.4	13.6	10.6	5.8	14.8	10.8	5.9	162.0	149.2	54.2	
8.219.6	5.2	4.8	20.6	5.6	3.5	20.2	6.3	8.1	16.0	6.9	10.4	14.0	5.6	10.8	15.7	4.5	114.8	192.9	57.1	
9.019.5	2.5	5.5	23.5	2.0	7.0	16.5	5.5	11.0	14.5	5.5	9.5	13.0	7.5	13.0	14.5	3.8	181.0	191.0	44.0	
10.014.7	6.3	7.2	15.3	8.5	12.8	11.2	6.0	12.6	9.7	8.7	11.0	10.1	8.9	8.1	12.8	10.6	114.8	145.3	105.2	
2.014.8	6.0	10.4	14.8	5.8	14.4	11.0	4.6	14.2	10.0	6.8	10.7	11.2	8.1	8.7	11.5	10.8	128.2	146.4	90.8	
8.714.8	7.5	8.8	15.1	7.1	12.8	10.1	7.1	13.9	9.9	7.2	11.5	10.3	8.2	9.9	11.4	9.7	127.8	141.8	95.7	
8.416.0	6.6	8.7	15.9	6.4	11.5	11.4	7.1	13.3	9.2	8.5	11.4	9.8	8.8	8.7	10.2	12.1	118.0	143.2	104.1	
10.315.0	5.7	11.2	15.5	4.3	12.8	10.3	6.9	14.6	9.9	6.5	9.9	11.0	9.1	8.6	10.0	12.4	124.0	141.4	99.9	
7.917.1	6.0	8.2	18.2	4.6	10.8	12.8	6.4	12.9	11.7	6.4	10.0	10.1	9.9	7.4	11.9	11.7	111.9	156.1	97.3	
11.215.4	4.4	13.1	15.1	2.8	14.5	9.4	6.1	14.6	10.6	5.8	10.8	10.1	9.1	9.7	9.3	12.0	126.1	146.1	93.1	
11.714.3	5.0	13.7	12.3	5.0	15.7	9.7	4.0	10.7	13.0	7.3	10.6	11.8	7.6	9.8	11.3	10.4	128.4	140.4	96.7	
12.215.3	5.3	16.0	11.5	3.5	15.3	9.2	5.5	13.6	11.4	6.0	12.7	8.2	9.1	10.7	8.9	11.4	148.6	129.5	92.3	
11.416.2	2.4	12.5	13.9	4.6	12.6	11.8	5.0	14.4	10.8	5.8	10.6	10.8	8.6	8.5	10.8	11.7	124.6	146.1	94.6	
13.215.8	2.0	12.4	15.7	2.9	12.2	12.9	4.0	14.6	11.8	4.6	10.0	11.9	8.1	8.5	11.0	11.5	124.2	157.2	83.9	
11.717.0	2.3	13.3	15.0	2.7	13.7	12.3	4.0	13.3	15.3	4.4	11.0	10.1	8.0	8.3	13.0	9.7	129.8	137.3	78.4	
13.814.1	3.1	4.7	15.7	4.6	11.9	12.7	5.4	12.3	13.4	5.3	8.5	11.7	9.8	7.8	12.7	11.0	119.5	150.2	95.6	
15.110.9	5.0	12.8	12.3	5.9	14.6	11.9	3.5	13.1	11.4	6.5	11.0	9.3	9.7	9.7	10.4	10.9	150.1	136.1	78.1	

Average number of clear, fair, and cloudy days at stations

Stations.	January.			February.			March.			April.			May.			June.		
	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
Ohio Valley and Tennessee.																		
Chattanooga, Tenn.	6.2	9.0	15.8	6.8	10.0	11.5	10.2	9.1	11.7	9.3	12.0	8.7	12.0	13.0	6.0	10.7	14.3	4.5
Knoxville, Tenn.	6.1	10.2	14.7	7.3	9.5	11.5	8.9	11.5	10.0	9.8	10.9	9.6	11.4	13.7	8.0	8.1	14.9	7.0
Memphis, Tenn.	7.3	9.5	14.2	7.9	8.4	12.0	9.0	10.4	11.0	10.1	10.5	9.4	10.1	13.8	7.1	8.7	15.8	5.5
Nashville, Tenn.	5.5	10.7	14.8	6.2	9.5	12.4	8.2	10.9	11.9	7.8	12.2	10.0	9.2	14.2	7.6	6.3	17.1	4.6
Louisville, Ky.	6.3	9.5	15.2	6.5	10.4	11.4	7.2	11.4	12.4	8.5	10.7	10.8	11.1	13.1	7.9	6.6	12.8	9.6
Indianapolis, Ind.	5.4	10.9	14.7	6.3	9.4	12.5	6.8	10.9	13.8	7.0	12.6	10.4	9.5	12.6	8.9	6.7	13.6	9.7
Cincinnati, Ohio.	5.3	10.0	15.7	5.6	10.1	12.6	6.4	12.0	12.6	8.1	11.8	10.1	9.3	13.7	7.8	7.1	13.1	9.8
Columbus, Ohio.	2.7	10.8	15.5	4.0	11.0	13.8	4.7	11.8	14.5	10.0	8.8	11.2	11.0	13.5	7.0	8.5	12.2	8.3
Pittsburg, Pa.	4.2	11.1	14.5	4.8	11.8	11.7	4.5	13.5	13.0	7.0	13.2	9.8	10.3	13.0	7.7	7.2	10.2	6.6
Lower Lakes:																		
Buffalo, N. Y.	1.4	9.0	20.6	4.4	10.6	13.2	5.0	12.5	13.5	6.4	11.8	11.8	9.4	12.0	9.6	8.0	14.0	8.0
Oswego, N. Y.	1.1	7.3	22.6	3.2	8.4	16.7	4.1	10.5	16.4	6.5	10.6	12.9	9.2	12.2	9.6	5.5	12.8	8.7
Rochester, N. Y.	1.4	8.2	21.2	3.1	11.1	14.1	3.9	11.4	15.7	7.3	10.3	12.4	8.8	12.9	9.3	8.1	12.4	9.5
Erie, Pa.	2.2	9.7	19.1	4.2	10.8	13.3	4.6	12.1	14.4	6.7	13.4	9.9	10.6	12.6	7.8	8.5	12.4	7.1
Cleveland, Ohio.	2.8	8.8	19.4	4.3	11.9	12.1	4.3	12.3	14.4	7.3	12.8	9.9	10.2	12.9	7.9	8.3	13.5	7.2
Sandusky, Ohio.	4.9	10.4	15.7	5.0	10.3	13.0	5.1	12.9	13.0	7.3	12.0	10.7	11.0	12.5	7.5	9.3	12.2	7.5
Toledo, Ohio.	3.0	11.1	12.3	4.4	11.1	12.4	5.6	10.1	15.3	6.6	12.5	10.9	9.4	12.5	8.1	7.6	13.9	8.5
Detroit, Mich.	3.7	9.9	17.4	5.4	11.1	11.5	5.4	12.4	13.2	7.1	12.7	10.2	9.4	13.6	8.0	8.7	12.3	8.0
Upper Lakes:																		
Alpena, Mich.	2.4	11.8	16.8	5.7	10.6	12.0	6.5	12.7	11.8	9.3	11.8	8.9	9.7	13.6	6.7	10.1	12.5	6.4
Escanaba, Mich.	5.0	13.1	12.9	5.6	11.9	10.8	7.7	12.4	10.9	8.5	12.4	9.1	7.7	13.4	9.9	7.9	14.9	7.2
Grand Haven, Mich.	1.8	8.3	20.9	4.6	10.5	13.2	4.9	12.9	13.2	8.8	12.0	9.2	11.6	12.0	7.4	9.5	12.9	6.6
Mackinaw City, Mich.	3.0	14.5	13.5	6.5	9.5	12.5	10.0	10.2	9.0	9.5	11.0	9.6	6.5	13.0	11.5	10.5	11.1	5.0
Marquette, Mich.	4.0	12.5	14.5	5.1	11.1	12.2	7.8	12.4	10.8	8.7	13.0	8.3	9.4	12.8	8.4	9.7	12.6	7.7
Port Huron, Mich.	3.3	12.3	15.4	4.9	10.9	12.5	4.7	13.7	12.6	7.5	12.0	10.5	8.7	12.9	8.4	8.3	14.2	7.5
Chicago, Ill.	7.4	12.9	10.7	7.9	11.3	9.0	6.8	12.9	11.3	8.2	11.7	10.1	10.9	11.8	8.3	7.6	14.3	8.1
Milwaukee, Wis.	5.4	15.0	10.6	5.8	12.5	10.0	6.5	13.3	11.2	6.8	13.4	9.8	8.8	13.6	8.6	6.6	16.1	7.3
Duluth, Minn.	10.5	11.5	9.0	8.1	10.3	9.8	11.0	11.0	9.0	9.7	10.7	9.6	8.5	12.2	10.3	7.1	12.3	9.6
Upper Mississippi Valley:																		
Saint Paul, Minn.	8.1	13.2	9.7	8.2	10.7	9.2	8.2	12.1	10.7	8.2	11.6	10.2	9.1	13.9	8.0	7.9	13.4	6.7
La Crosse, Wis.	9.0	12.5	9.2	8.0	11.9	8.3	8.3	12.0	10.1	9.8	11.3	8.9	9.7	12.0	9.8	8.6	12.9	7.5
Davenport, Iowa.	8.5	14.1	11.1	7.6	10.9	9.8	7.5	12.8	10.7	8.1	12.2	9.7	9.1	13.6	9.3	7.1	14.7	8.2
Des Moines, Iowa.	10.8	11.4	8.8	8.8	10.8	8.7	7.7	13.5	9.8	8.3	10.9	10.8	7.3	11.7	12.0	5.3	14.2	10.5
Dubuque, Iowa.	6.7	12.4	11.9	7.2	10.5	10.5	5.7	13.2	12.1	7.1	12.1	10.8	7.5	12.0	11.5	5.5	14.1	11.4
Keokuk, Iowa.	5.9	11.9	13.2	5.9	11.4	11.0	4.2	14.6	12.2	5.0	14.2	10.9	4.5	16.3	10.2	3.6	15.4	11.0
Dubuque, Iowa.	6.4	12.0	12.6	7.7	10.3	10.5	8.8	11.5	10.7	8.1	12.9	9.6	8.9	14.2	7.9	9.2	14.8	6.0
Cairo, Ill.	8.0	12.0	11.0	8.0	10.4	10.0	8.8	11.2	11.0	9.2	12.2	8.4	10.6	12.8	7.6	6.4	15.2	8.4
Springfield, Ill.	8.9	11.2	10.9	8.4	10.6	9.3	7.9	11.6	11.5	9.0	11.8	9.2	10.0	11.9	9.1	8.0	14.1	7.9
Saint Louis, Mo.	9.3	11.5	10.2	8.8	11.0	9.5	8.5	13.5	7.0	8.7	14.0	10.0	7.1	13.6	10.3	9.0	15.1	5.9
Missouri Valley:																		
Leavenworth, Kans.	9.8	11.5	10.2	8.8	11.0	9.5	8.5	13.5	7.0	8.7	14.0	10.0	7.1	13.6	10.3	9.0	15.1	5.9
Omaha, Neb.	9.6	12.1	9.3	9.0	10.8	8.4	8.9	12.6	9.5	8.6	10.2	11.2	7.1	12.1	12.7	8.2	12.4	8.4
Bennett, Fort, Dak.	8.0	17.2	5.8	10.0	11.3	7.0	7.8	14.0	9.2	7.0	11.1	11.8	7.8	12.5	10.7	11.5	12.2	6.3
Huron, Dak.	9.7	17.8	4.0	9.7	10.7	8.0	5.0	16.0	10.0	8.0	11.3	10.7	9.7	12.3	9.0	11.3	15.3	3.4
Yankton, Dak.	10.8	14.3	5.9	9.3	10.8	8.1	8.8	12.9	9.3	10.0	11.6	8.4	8.1	12.3	10.7	9.8	14.2	6.0
Extreme Northwest:																		
Moorhead, Minn.	10.5	15.8	5.2	7.5	12.2	8.5	6.2	15.5	9.3	9.0	12.8	8.2	9.2	13.5	9.3	8.5	14.5	7.0
Saint Vincent, Minn.	10.7	15.5	4.8	8.0	13.2	7.0	10.0	14.5	6.5	11.0	12.8	6.2	11.2	14.5	6.3	9.5	15.5	4.7
Bismarck, Dak.	10.2	14.1	6.7	7.8	11.7	8.8	6.8	13.1	11.1	7.7	12.2	10.1	6.7	13.8	10.5	6.7	14.0	7.3
Buford, Fort, Dak.	7.7	15.9	7.4	9.3	12.4	6.5	8.7	14.0	8.3	10.2	12.2	7.6	9.1	14.1	7.8	8.5	14.7	6.8
Northern Slope:																		
Assinaboine, Ft., Mont.	7.0	15.5	8.5	9.2	12.0	7.0	11.0	12.0	8.0	9.5	14.5	6.0	8.3	16.0	6.7	12.7	17.1	5.0
Benton, Fort, Mont.	5.8	11.8	13.4	6.2	12.4	9.8	8.6	11.8	10.4	8.3	13.5	8.2	8.8	14.0	8.2	9.8	13.5	5.7
Custer, Fort, Mont.	8.2	15.5	7.3	4.0	16.5	8.0	8.0	16.0	7.0	5.8	16.0	7.4	6.2	17.3	7.5	9.2	15.3	5.5
Helena, Mont.	8.5	14.5	13.0	5.2	15.2	7.8	10.8	13.7	6.5	8.4	13.8	7.8	6.2	16.6	8.0	8.8	15.2	6.0
Maginnis, Fort, Mont.	5.0	12.0	14.0	7.0	14.0	7.5	9.5	8.0	13.5	7.5	12.0	10.5	7.0	14.0	10.0	10.5	11.0	8.5
Shaw, Fort, Mont.	7.0	15.5	8.5	8.5	12.8	6.8	12.5	11.5	7.0	9.6	13.0	7.4	7.6	17.6	6.8	8.4	15.4	5.2
Deadwood, Dak.	11.0	13.6	6.4	8.6	14.0	5.7	9.4	13.4	8.2	7.7	12.0	10.3	7.3	13.9	9.8	8.7	16.2	5.1
Cheyenne, Wyo.	13.6	13.5	3.9	12.7	11.8	3.8	11.7	13.6	5.7	8.9	14.1	7.0	7.8	14.9	9.2	11.6	12.4	5.0
North Platte, Nebr.	11.7	13.9	5.4	10.4	12.6	5.3	8.6	14.3	8.1	8.6	15.3	6.1	8.3	14.9	9.8	8.9	17.4	3.7
Middle Slope:																		
Denver, Colo.	10.0	11.4	3.6	13.2	11.6	3.4	13.8	11.4	6.8	9.9	12.9	7.2	8.9	14.8	7.3	13.0	12.4	3.6
Pike's Peak, Colo.	14.2	11.7	5.1	9.9	13.2	5.2	11.1	12.5	7.4	7.4	15.4	7.7	7.5	16.7	6.8	10.7	16.1	3.2
West Las Animas, Colo.	13.0	13.5	4.5	16.0	9.0	3.3	13.0	14.7	3.8	9.0	15.0	6.0	6.7	13.8	7.0	11.7	14.0	3.7
Lodge City, Kans.	12.3	10.2	8.5	12.1	9.6	6.6	12.3	11.7	7.0	12.2	11.8	6.0	6.3	15.1	9.6	11.7	13.8	4.5
Elliott, Fort, Tex.	17.2	7.2	6.6	15.2	1.6	6.4	13.5	12.6	5.0	17.2	7.4	4.4	10.8	12.4	6.5	15.4	10.6	4.0
Southern Slope:																		
Sill, Fort, Ind. T.	10.3	12.7	8.0	9.3	10.1	8.8	11.6	12.8	6.6	13.4	11.8	4.8	10.7	13.8	6.5	14.3	12.0	2.7
Concho, Fort, Tex.	14.0	8.4	6.8	13.0	7.0	8.3	14.6	8.9	7.5	14.9	10.6	4.5	10.2	12.0	7.8	15.5	10.0	3.6
Davis, Fort, Tex.	17.7	9.8	3.5	14.7	9.5	4.0	16.8	8.7	4.5	20.1	7.3	2.6	15.3	12.7	3.0	16.4	11.9	1.7
Stockton, Fort, Tex.	19.7	6.4	4.9	15.7	8.3	4.3	18.5	7.7	3.8	17.9	8.8	3.8	16.0	11.3	4.1	11.6	9.1	2.6
Southern Plateau:																		
Santa Fe, N. Mex.	15.3	11.1	4.6	11.8	12.5	4.4	12.6	13.7	4.7	11.5	14.7	3.8	12.4	15.3	4.2	12.7	13.9	2.4
El Paso, Tex.	17.0	10.8	3.2	16.8	7.9	3.5	20.5	6.8	2.7	21.1	7.8	1.0	23.2	6.7	1.7	11.5	9.5	2.6

of the Signal Service, United States Army, &c.—Continued.

July.			August.			September.			October.			November.			December.			Annual.		
Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
10.8	15.9	4.3	7.8	17.0	6.2	12.2	18.5	4.8	11.7	11.3	8.0	11.2	9.5	9.3	8.2	10.8	12.5	117.3	146.3	101.7
10.1	14.7	6.2	10.2	14.7	6.1	13.9	10.0	6.1	15.4	8.6	7.0	9.2	10.4	10.4	8.3	10.6	12.1	117.4	139.1	108.8
10.8	14.6	5.6	13.2	12.1	5.7	18.1	9.9	7.0	13.7	10.6	6.7	10.1	9.0	10.9	7.9	10.1	13.0	124.3	133.3	107.7
8.4	16.2	6.4	11.6	14.6	4.8	11.9	11.8	6.4	12.7	11.1	7.2	8.4	11.1	10.5	5.7	10.8	14.5	100.9	143.6	115.8
9.2	14.8	6.0	11.8	13.6	5.6	11.5	11.9	6.6	12.2	12.1	6.7	7.7	10.1	12.2	5.9	9.7	15.4	104.3	140.1	120.9
9.2	14.1	7.7	11.4	14.0	5.6	11.6	11.7	6.7	9.8	12.8	8.4	6.6	10.1	13.3	5.2	9.8	16.0	94.5	142.7	128.1
9.5	13.1	8.4	11.8	12.4	7.3	11.3	10.7	8.0	11.3	11.3	8.4	7.3	11.1	11.6	5.4	11.2	14.4	97.3	139.6	128.4
9.8	16.3	4.9	12.7	11.3	7.0	10.8	12.6	6.6	9.6	12.7	8.7	6.6	12.1	11.3	8.1	10.4	17.5	95.7	144.1	125.5
8.1	16.7	6.2	10.4	14.7	5.9	8.9	13.8	7.3	8.4	13.5	9.1	5.3	11.9	12.8	2.2	12.7	16.1	80.4	162.6	122.3
8.9	15.7	6.4	10.8	13.8	6.4	8.6	12.4	9.0	7.2	11.1	12.7	2.4	9.3	18.3	0.6	8.2	22.2	74.5	139.5	151.3
9.1	14.6	7.3	10.0	13.4	7.6	7.8	12.0	10.7	5.4	10.0	15.6	1.4	6.4	22.2	0.6	5.5	24.9	66.6	123.6	175.1
8.8	14.8	7.4	10.6	13.5	6.9	8.4	12.8	8.8	6.5	11.2	13.3	2.6	8.9	18.5	0.9	6.5	23.6	70.9	137.5	161.9
10.4	15.3	5.3	12.0	13.8	5.2	9.0	12.2	8.8	7.7	9.2	14.1	2.0	8.8	19.2	1.5	6.6	22.9	81.0	137.4	146.9
9.7	15.7	5.6	12.6	13.3	5.1	9.0	11.6	8.8	8.5	10.6	11.9	3.4	9.3	17.3	2.1	9.6	19.3	84.1	142.4	138.8
10.8	14.5	5.7	11.9	13.3	5.8	10.6	13.1	6.3	9.1	12.0	9.9	4.6	11.9	13.5	2.7	9.4	18.9	92.5	145.2	127.6
9.5	15.0	6.5	12.0	12.5	6.5	10.6	11.8	7.6	8.6	11.7	10.7	5.0	11.2	13.8	3.0	10.8	17.2	86.0	144.7	134.6
9.8	15.1	6.1	11.8	12.6	6.6	9.7	12.9	7.4	8.6	12.0	10.4	5.1	10.5	14.4	2.5	11.6	10.9	87.3	147.9	130.1
10.7	14.4	5.9	11.6	13.9	5.5	8.7	11.9	9.4	6.5	11.0	13.5	1.9	11.6	16.5	1.6	9.1	20.3	84.8	144.4	136.0
9.7	15.1	6.2	10.2	13.4	7.4	7.5	14.0	8.5	5.4	11.1	14.5	3.8	11.3	14.9	8.6	11.0	15.8	80.9	154.7	129.7
13.9	18.2	3.9	13.7	13.2	4.1	10.4	13.0	6.6	8.2	10.6	12.2	3.2	9.5	17.3	1.4	7.4	22.2	91.8	136.3	137.3
9.6	18.0	7.0	13.5	11.5	6.0	9.0	13.7	7.3	4.0	13.7	13.3	1.7	9.0	19.3	0.3	5.7	25.0	79.5	141.0	145.0
9.9	15.0	6.1	11.1	13.1	6.8	7.2	12.2	10.6	5.2	11.2	14.6	2.2	10.0	17.4	2.7	9.5	18.8	82.3	145.8	137.2
9.2	15.9	5.9	10.3	14.3	6.4	8.5	14.4	7.1	5.6	13.5	11.9	4.0	11.7	14.3	2.0	10.3	18.7	75.7	157.4	132.2
12.4	13.4	5.2	12.7	13.5	4.8	11.2	12.4	6.4	9.4	12.5	9.1	6.8	10.4	12.8	6.5	11.5	13.0	107.9	148.8	108.6
9.9	14.4	4.7	9.5	15.7	5.4	8.4	14.6	7.0	6.9	12.4	10.7	5.0	11.8	13.2	5.0	12.6	13.4	84.9	168.4	112.0
9.4	15.7	5.9	9.7	13.2	8.1	7.7	12.1	10.2	6.8	9.9	14.3	5.7	11.1	13.2	7.6	11.1	12.3	101.8	142.2	121.3
10.2	16.2	4.6	10.3	14.9	5.8	9.1	13.6	7.3	10.3	12.2	8.5	6.9	13.2	9.9	8.4	12.6	10.0	104.9	159.7	100.7
10.9	15.9	6.2	10.9	14.0	6.1	10.8	12.0	7.2	9.1	11.7	10.2	6.3	11.1	12.6	8.1	12.2	10.7	106.9	156.1	105.3
10.5	15.3	5.2	12.1	13.1	5.8	10.6	12.9	6.2	10.1	11.0	9.9	7.3	11.1	11.6	5.9	12.2	12.9	104.4	149.6	111.8
8.8	15.0	6.2	11.4	12.7	6.9	10.9	12.3	6.8	10.9	11.8	8.3	11.0	11.6	7.4	6.1	13.3	11.6	106.5	149.0	109.8
9.8	15.0	6.7	9.8	14.5	6.7	8.5	14.5	8.1	7.3	12.3	11.4	5.7	11.7	12.6	5.5	11.7	13.8	86.8	151.9	126.6
7.0	16.5	7.5	9.1	15.7	6.2	9.8	12.8	7.4	8.7	12.7	9.6	5.6	11.8	12.6	5.2	11.4	14.4	75.5	185.4	124.4
11.9	12.2	6.3	15.2	12.2	6.3	13.9	11.1	5.0	13.6	10.8	6.6	9.1	10.4	10.5	7.4	10.5	13.1	119.8	142.4	103.1
13.5	13.7	3.8	12.8	15.7	2.5	14.2	11.5	4.3	11.2	12.3	7.5	9.5	12.2	8.3	6.0	11.7	13.3	119.0	150.4	96.0
11.1	13.2	6.7	13.9	13.6	5.3	13.9	11.1	5.0	13.3	11.6	6.1	7.9	12.2	9.9	6.9	11.1	13.0	119.1	143.8	102.4
11.4	14.8	5.3	13.6	12.6	4.8	12.7	11.4	5.9	12.2	12.2	6.6	10.7	11.8	7.5	8.8	11.8	10.4	120.2	149.6	95.5
10.6	14.4	6.0	11.8	13.1	6.1	13.2	10.2	6.6	13.0	10.5	7.5	11.0	10.8	8.2	8.9	12.6	9.5	119.9	141.9	108.5
9.0	17.3	4.7	11.5	15.2	4.3	11.5	15.2	4.3	11.0	12.3	7.4	9.8	14.0	6.2	8.2	15.2	7.6	109.8	170.5	85.0
10.2	15.3	5.5	13.2	14.0	3.8	11.5	13.8	4.7	8.0	13.5	9.5	12.8	10.7	6.5	10.3	14.2	6.5	120.7	164.6	80.0
10.8	15.0	5.2	12.8	13.2	5.0	12.4	12.1	5.5	11.7	11.7	7.6	10.6	12.7	6.7	9.7	12.7	8.6	126.1	151.7	87.5
8.5	16.6	5.9	10.5	15.8	4.7	8.8	14.7	6.5	7.5	13.8	9.7	5.5	15.2	9.3	7.6	16.3	7.1	99.4	175.2	90.7
9.8	16.2	5.0	12.0	14.8	4.2	10.2	14.0	5.8	7.2	10.6	13.2	6.0	15.6	8.4	10.0	15.6	5.4	118.8	170.2	76.3
10.6	15.6	4.8	13.4	13.7	3.9	12.0	12.6	5.4	10.0	12.0	9.0	7.7	12.9	9.4	8.4	14.4	8.2	107.9	162.7	94.7
11.0	14.7	5.2	15.5	11.8	8.7	12.5	12.6	4.9	8.0	13.3	9.7	6.2	16.0	7.8	8.7	15.4	6.9	116.7	166.7	81.9
12.2	15.3	2.5	15.6	13.2	2.2	11.6	13.4	5.0	9.2	12.8	9.0	7.8	14.2	8.0	9.0	14.4	7.6	132.3	165.3	67.7
14.5	13.2	3.1	17.0	11.0	3.0	10.7	13.1	5.5	6.2	6.7	13.4	10.9	7.4	13.2	9.4	5.8	15.0	102.2	109.6	155.8
11.5	15.8	3.7	14.8	13.6	2.6	14.9	11.5	4.5	9.2	12.5	9.3	7.7	16.5	5.8	7.0	12.3	11.7	104.0	180.5	81.0
13.8	14.8	2.4	18.0	11.0	2.0	14.8	11.8	3.4	9.6	15.6	5.8	9.6	14.4	6.0	8.1	15.1	7.8	113.2	176.3	75.8
11.5	15.5	4.0	16.6	9.7	4.7	14.3	8.0	7.7	10.0	13.0	8.0	9.7	12.7	7.6	8.7	11.7	10.6	120.5	137.0	108.0
15.0	13.4	2.6	17.0	10.6	2.8	14.2	10.8	5.0	8.4	14.6	8.0	10.0	13.3	6.8	8.8	14.0	8.2	127.5	165.8	72.0
13.2	12.8	3.0	15.6	11.4	3.6	18.6	8.6	2.8	14.9	11.1	2.9	14.4	9.6	6.0	10.9	13.1	7.0	143.8	151.4	70.2
13.1	13.8	5.1	12.5	14.4	4.1	16.4	9.8	3.8	15.2	10.6	5.2	13.5	12.0	4.5	13.1	12.8	5.1	149.6	153.3	62.4
10.1	16.5	4.4	12.9	14.7	3.4	13.0	13.3	3.7	12.2	13.3	5.5	10.7	15.1	4.2	9.8	14.3	6.9	124.1	174.2	67.0
12.2	14.7	4.1	11.8	14.4	4.8	17.1	9.1	3.8	15.8	10.2	5.0	15.5	10.6	3.9	14.1	13.9	3.0	161.1	148.2	56.0
7.5	17.2	6.3	7.4	17.6	6.0	13.6	12.9	3.5	15.2	11.5	4.3	14.5	9.8	5.7	12.3	13.7	5.0	131.8	167.6	69.5
10.9	15.0	6.0	12.7	12.6	5.7	16.3	10.7	3.0	15.3	10.0	5.7	17.0	11.3	1.7	9.7	15.7	5.6	139.0	165.0	61.5
10.9	14.8	5.3	14.4	12.1	4.4	14.8	11.4	3.8	16.2	8.5	6.3	14.1	10.8	5.1	12.2	12.1	6.6	149.8	143.3	72.2
11.4	12.4	7.2	15.4	10.9	4.7	17.4	7.6	5.0	16.2	7.6	7.2	17.0	7.3	5.7	17.1	7.2	6.7	183.8	111.6	69.9
12.2	14.3	4.5	15.9	12.7	2.4	14.4	10.7	4.9	13.8	11.6										

Average number of clear, fair, and cloudy days at stations

Stations.	January.			February.			March.			April.			May.			June.		
	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
Southern Plateau.—																		
Continued:																		
Apache, Fort, Ariz.	15.3	10.2	5.5	13.7	8.5	6.2	17.0	8.3	5.7	17.0	10.7	2.3	22.2	6.2	1.6	22.3	5.5	2.2
Grant, Fort, Ariz.	16.2	9.5	5.3	13.2	8.5	6.7	16.0	9.7	5.3	20.4	8.6	1.0	22.9	6.0	2.1	19.3	9.0	1.7
Prescott, Ariz.	18.1	10.8	2.1	17.2	7.5	3.6	17.8	9.3	3.9	19.7	8.1	2.2	24.2	5.9	0.9	24.7	4.6	0.7
Thomas, Camp, Ariz.	16.3	12.4	2.3	12.0	12.2	4.0	16.0	10.2	4.8	18.8	8.8	2.4	23.6	6.4	1.0	20.0	8.4	1.6
Yuma, Ariz.	20.3	8.3	2.4	18.6	7.1	2.7	21.8	7.3	1.9	23.4	5.6	1.0	27.2	3.1	0.7	27.1	2.7	0.2
Middle Plateau:																		
Winnemucca, Nev.	11.7	12.0	7.3	10.0	10.5	7.7	13.2	11.1	6.7	10.7	12.2	7.1	13.3	12.2	5.5	15.0	12.6	2.4
Salt Lake City, Utah.	8.2	11.6	11.2	7.5	10.8	10.0	9.7	10.8	10.5	7.6	12.6	9.8	10.7	13.0	7.3	15.2	11.7	3.1
Northern Plateau:																		
Boise City, Idaho.	7.3	9.3	14.4	6.3	10.3	11.7	9.0	12.6	9.4	8.0	13.3	8.7	9.1	15.2	6.7	11.3	14.1	4.6
Lewiston, Idaho.	4.0	9.4	17.6	6.4	9.4	12.6	9.6	12.6	8.8	10.2	11.4	8.4	11.2	13.2	6.6	10.6	12.6	6.8
Dayton, Wash.	3.0	11.0	17.0	7.0	9.6	11.8	9.6	13.6	7.8	9.0	11.2	9.8	10.8	13.0	7.2	10.0	13.8	6.2
Spokane Falls, Wash.	6.0	12.7	12.3	7.5	8.0	12.8	10.2	12.5	8.3	9.2	12.0	8.8	9.8	14.7	6.5	9.0	13.2	7.8
North Pacific Coast:																		
Canby, Fort, Wash.	8.0	10.0	13.0	13.0	10.0	6.0	7.0	19.0	5.0	7.0	16.0	7.0	8.0	15.0	8.0	2.0	17.0	11.0
Olympia, Wash.	2.3	9.3	19.4	3.4	7.4	17.4	4.6	10.4	16.0	4.3	12.3	13.4	6.6	11.3	13.1	6.0	11.1	12.9
Tatoosh Island, Wash.	9.0	4.0	18.0	10.0	9.0	10.0	4.0	13.0	14.0	8.0	8.0	14.0	11.0	11.0	9.0	3.0	12.0	15.0
Portland, Oreg.	3.9	7.2	19.9	2.8	6.4	19.0	4.4	7.5	19.1	5.3	9.1	15.6	5.5	10.0	15.5	6.9	9.6	13.5
Roseburg, Oreg.	3.2	10.0	17.8	4.1	8.1	16.0	6.7	10.4	13.9	4.3	10.7	15.0	8.7	11.3	11.0	11.0	9.9	9.1
Middle Pacific Coast:																		
Cape Mendocino, Cal.	9.0	8.0	14.0	13.0	8.0	8.0	11.5	8.0	11.5	6.0	13.5	10.5	11.0	15.0	5.0	13.5	12.5	4.0
Red Bluff, Cal.	13.9	8.3	8.8	11.4	8.9	8.0	13.7	10.3	7.0	13.0	9.9	7.1	15.9	10.0	5.1	23.4	4.7	1.9
Sacramento, Cal.	12.6	9.9	8.5	12.2	8.3	7.7	15.4	7.6	8.0	14.4	9.9	5.7	20.0	7.7	3.3	24.8	4.0	1.2
San Francisco, Cal.	11.7	10.1	9.2	9.5	10.2	8.5	11.5	11.4	8.1	12.0	11.6	6.4	14.4	10.7	5.9	12.3	10.9	6.8
South Pacific Coast:																		
Los Angeles, Cal.	17.4	8.4	5.2	12.7	9.3	6.3	12.0	10.9	8.1	10.3	12.6	7.1	12.6	12.4	6.0	8.4	16.0	5.6
San Diego, Cal.	11.5	11.3	8.2	8.9	11.3	8.0	8.4	13.1	9.5	9.7	12.7	7.6	7.5	12.6	10.9	6.8	15.0	8.2
Alaska Stations:																		
Saint Michael's, Fort, Alaska.	6.4	9.4	15.2	12.4	7.0	8.9	8.5	10.4	12.1	5.7	9.0	15.3	4.1	9.9	17.0	3.5	10.7	15.8
Sitka, Alaska.	4.3	9.2	17.5	7.5	9.2	11.7	7.0	8.2	15.8	6.8	9.6	13.6	5.8	9.8	15.4	6.7	6.2	17.1
Unalashka, Alaska.	1.6	5.4	24.0	0.8	3.6	24.0	2.8	6.4	21.8	1.4	4.7	23.9	0.8	8.2	22.0	0.8	5.5	23.7

of the Signal Service, United States Army, &c.—Continued.

July.			August.			September.			October.			November.			December.			Annual.		
Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.	Clear.	Fair.	Cloudy.
10.7	12.7	7.6	10.1	14.9	6.0	18.0	8.0	4.0	21.6	7.1	2.3	31.4	6.3	2.3	17.0	8.9	5.1	207.5	109.0	43.8
8.7	15.9	6.4	9.4	15.0	6.6	20.1	7.4	2.5	21.5	6.9	2.6	20.1	7.3	2.6	17.1	7.9	6.0	208.5	113.3	43.5
16.6	11.6	2.8	15.2	12.1	2.7	24.1	4.8	1.1	23.2	4.5	1.3	22.4	6.3	1.3	19.5	8.7	2.8	234.8	102.0	23.6
12.0	14.4	4.6	10.4	16.8	3.8	19.8	7.8	2.4	20.3	8.2	2.5	20.4	7.6	2.0	18.8	9.4	4.8	204.3	124.8	34.2
23.0	7.3	0.7	2.8	7.7	1.5	23.1	3.0	0.3	23.8	6.5	0.7	22.9	5.9	1.2	21.6	7.4	2.0	273.9	71.1	14.3
34.0	6.3	0.7	23.8	4.3	0.9	22.2	5.5	2.3	18.5	9.8	2.7	15.5	10.5	4.0	13.3	10.0	7.7	189.8	117.5	57.9
16.5	11.8	2.7	16.2	11.9	2.9	17.7	9.6	2.7	12.8	11.0	6.0	10.8	10.7	8.5	8.3	9.9	12.8	143.3	133.8	33.2
18.1	11.6	1.3	21.7	8.0	1.3	16.6	8.9	4.5	12.4	10.6	8.0	11.0	10.8	8.2	7.3	9.1	14.6	134.6	131.9	98.8
16.8	11.4	2.8	22.3	7.0	1.7	16.0	10.0	4.0	9.0	11.0	11.0	8.6	9.8	11.6	7.0	8.2	15.8	132.3	125.5	107.6
17.4	10.8	2.8	21.8	8.2	1.0	13.4	12.0	4.0	0.0	12.0	9.4	10.4	10.4	9.2	5.3	9.3	16.4	127.4	136.8	101.2
13.5	12.0	5.5	20.8	8.5	1.7	13.8	11.5	4.7	6.6	11.5	13.0	5.0	12.8	12.2	4.8	11.5	14.7	129.3	137.3	98.7
1.0	16.0	14.0	11.0	14.0	6.0	10.6	9.7	9.7	10.0	11.0	10.0	9.5	8.0	12.5	6.7	13.5	10.8	101.6	158.8	106.6
10.7	13.0	7.3	11.0	13.6	6.4	6.1	12.0	11.9	3.6	12.0	15.4	2.5	9.6	17.9	2.0	7.6	21.4	64.1	127.9	173.3
2.0	14.0	15.0	14.0	10.0	7.0	4.0	15.0	11.0	7.5	11.5	12.0	3.0	9.0	18.0	5.5	9.0	16.5	81.0	129.0	157.0
14.7	7.7	8.6	14.8	9.1	7.1	11.8	10.0	8.2	7.2	10.0	13.8	5.2	8.9	15.9	4.1	7.5	19.4	87.3	103.1	174.9
17.2	9.8	4.0	19.9	9.0	2.1	15.6	8.9	5.5	7.0	13.7	10.3	3.7	13.3	12.9	2.0	10.7	18.3	103.4	125.8	136.1
19.0	10.0	2.0	23.7	6.3	1.0	19.0	8.0	3.0	15.0	12.3	3.7	10.8	14.4	4.8	8.0	12.5	10.5	165.0	132.5	63.0
27.7	3.2	0.1	28.5	2.4	0.1	25.2	3.9	0.9	21.2	7.3	2.5	20.2	5.4	4.4	12.8	9.6	8.6	227.7	81.7	55.3
29.6	1.3	0.1	29.5	1.5	0.0	25.9	3.6	0.5	23.4	5.5	2.1	19.6	6.5	3.9	13.2	8.0	9.8	240.0	74.9	50.4
8.2	15.4	7.4	9.3	14.8	6.9	12.9	12.0	4.5	15.2	11.5	4.3	14.9	9.6	5.5	12.9	9.5	8.6	146.7	139.0	79.6
12.1	18.1	0.8	16.6	13.3	1.1	17.5	11.1	1.4	17.5	10.6	2.9	19.0	9.0	2.0	17.0	8.9	5.1	171.3	142.4	51.6
8.2	16.6	6.2	9.5	17.1	4.4	12.1	13.6	4.3	13.2	12.3	5.5	13.6	10.4	6.0	12.9	11.4	6.7	122.3	157.6	85.4
3.2	7.4	20.4	2.1	6.3	22.6	1.9	8.2	19.9	2.6	8.6	19.3	6.7	9.0	14.3	9.6	9.6	11.8	65.9	106.2	133.1
3.0	8.6	19.4	7.4	9.2	14.4	8.6	7.0	14.4	7.0	8.0	16.0	3.5	6.9	19.6	7.2	8.8	15.0	72.8	113.5	189.2
1.0	8.5	21.5	2.5	7.0	21.5	0.8	5.2	24.0	1.3	6.0	23.7	1.2	6.0	22.8	1.0	6.4	23.6	14.0	102.0	249.0

APPENDIX 50.

Directions from which the prevailing winds have been observed to blow at stations on the Central Pacific and Southern Pacific Railroads and connecting branches during each month of the year 1884.

[Copied from the records on file at the office of the chief engineer of the Central Pacific Railroad.]

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Alta, Cal.....	S.	SE.	S.	S.	NE.	S.	S.	S.	S.	N.	S.	S.	S.
Anaheim, Cal.....	N.	W.	SE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SE.	SW.	SW.
Antioch, Cal.....	SE.	NW.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.
Aptos, Cal.....	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	NW.	N.	NE.	NE.	NE.	NE.	NE.
Auburn, Cal.....	SE.	SE.	SE.	SE.	SE.	SE.	E.	E.	E.	S.	E.	S.	SE.
Battle Mountain, Nev.....	SW.	SW.	NE.	NE.	SW.	SW.	SW.	S.	S.	SW.	SE.	W.	SW.
Benson, Ariz.....	W.	S.	W.	W.	SW.	SW.	W.	W.	W.	W.	E.	W.	W.
Beowawa, Nev.....	S.	S.	S.	W.	S.	W.	N.	N.	SE.	S.	S.	S.	S.
Bishop Creek, Nev.....	(¹)	(¹)	N.	N.	S.	S.	W.	S.	N.	S.	S.	N.	N.
Blue Creek, Utah.....	E.	E.	SW.	S.	NE.	NE.	NE.	N.	N.	S.	N.	N.	N.
Boca, Cal.....	N.	SW.	N.	SW.	SW.	SW.	S.	SW.	SW.	W.	W.	SW.	SW.
Borden, Cal.....	SE.	SE.	SE.	(SE.)	NW.	NW.	NW.	NW.	NW.	NW.	SW.	SE.	NW.
Brentwood, Cal.....	NW.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.
Brighton, Cal.....	N.	N.	SE.	SE.	S.	S.	S.	SW.	N.	N.	N.	W.	N.
Brown's, Nev.....	SW.	SW.	SW.	SW.	SW.	SW.	SE.	SW.	{SW.}	W.	(¹)	SW.	.....
Byron, Cal.....	NW.	W.	SE.	W.	NW.	W.	W.	W.	W.	W.	W.	SE.	W.
Cabazon, Cal.....	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)
Caliente, Cal.....	W.	SE.	W.	W.	W.	W.	E.	W.	W.	W.	W.	W.	W.
Calistoga, Cal.....	SE.	W.	W.	W.	W.	W.	W.	W.	W.	W.	W.	SW.	W.
Carlin, Nev.....	N.	W.	W.	W.	W.	W.	W.	W.	W.	W.	N.	W.	W.
Casa Grande, Ariz.....	E.	W.	W.	SW.	N.	N.	W.	W.	S.	SW.	W.	W.	W.
Chico, Cal.....	S.	N.	S.	S.	S.	S.	S.	S.	S.	S.	N.	S.	S.
Chualar, Cal.....	S.	S.	S.	N.	N.	N.	N.	N.	N.	N.	N.	N.	N.
Checo, Cal.....	SW.	SW.	SW.	SW.	NE.	SW.	SW.	E.	SW.	SW.	SW.	SW.	SW.
Colfax, Cal.....	N.	S.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Colton, Cal.....	N.	SE.	W.	W.	W.	SW.	SW.	SW.	SW.	SW.	N.	SW.	SW.
Corinne, Utah.....	N.	N.	S.	N.	S.	S.	S.	N.	N.	N.	N.	N.	N.
Daggett, Cal.....	W.	W.	W.	W.	W.	W.	W.	W.	(¹)	.....	.....	.....	.....
Davisville, Cal.....	N.	N.	S.	S.	W.	W.	S.	S.	S.	S.	W.	S.	S.
Delano, Cal.....	S.	S.	SW.	SW.	(¹)	S.	SE.	SE.	SE.	E.	SE.	SE.	SE.
Delta, Cal.....	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	(¹)	NW.	N.	N.
Deming, N. Mex.....	E.	W.	W.	W.	W.	W.	W.	W.	SW.	E.	E.	E.	E.
Dunnigan, Cal.....	S.	N.	S.	N.	N.	S.	SE.	SE.	N.	N.	N.	N.	N.
Elko, Nev.....	N.	N.	W.	N.	N.	W.	W.	N.	W.	N.	N.	W.	N.
El Paso, Tex.....	N.	W.	S.	S.	S.	S.	(¹)	S.	(¹)	W.	N.	W.	N.
Emigrant Gap, Cal.....	E.	E.	S.	S.	E.	E.	E.	E.	SE.	E.	E.	SE.	E.
Farmington, Cal.....	SE.	SE.	SE.	SE.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	NW.
Fenner, Cal.....	SW.	W.	E.	E.	W.	W.	W.	(¹)	SE.	(¹)	.....	.....	.....
Fresno City, Cal.....	SE.	SE.	SE.	N.	N.	NW.	NW.	(¹)	NW.	NW.	SE.	S.	.....
Galt, Cal.....	SE.	SE.	SE.	SE.	NW.	W.	W.	NW.	W.	NW.	{NW.}	SE.	SE.
Gilroy, Cal.....	N.	W.	SW.	W.	W.	W.	W.	W.	N.	S.	S.	W.	W.
Goconda, Nev.....	E.	SW.	W.	E.	NW.	(¹)	SW.	W.	W.	E.	E.	NW.	.....
Goshen, Cal.....	SE.	SE.	SW.	SE.	NW.	NW.	NW.	NW.	NW.	(¹)	(¹)	SW.	.....
Hallock, Nev.....	S.	SW.	SW.	SW.	SW.	SW.	SW.	S.	(¹)	SW.	SW.	SW.	SW.
Hawthorne, Nev.....	(¹)	(¹)	NW.	W.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SW.	SW.
Hollister, Cal.....	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	NW.
Hot Springs, Nev.....	NW.	(¹)	N.	N.	N.	NE.	N.	W.	SW.	NW.	NE.	SW.	.....
Humboldt, Nev.....	NE.	SW.	N.	N.	SW.	N.	SW.	(¹)	N.	S.	(¹)	.....	.....
Indio, Cal.....	N.	SW.	(¹)	NW.	NW.	NW.	NE.	NE.	NE.	NE.	W.	NE.	NE.
Ione, Cal.....	SW.	SW.	SW.	SW.	(¹)	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Keeler, Cal.....	(¹)	(¹)	(¹)	S.	S.	N.	N.	N.	N.	N.	N.	N.	N.
Keene, Cal.....	SE.	SE.	NW.	NW.	NW.	NW.	(¹)	NW.	NW.	SE.	S.	{SE.}	.....
Kelton, Utah.....	N.	S.	S.	N.	W.	N.	W.	S.	N.	(¹)	S.	S.	.....
Kingsburg, Cal.....	SE.	SE.	SE.	N.	N.	N.	(¹)	N.	N.	N.	N.	S.	.....
Knight's Landing, Cal.....	N.	N.	N.	S.	S.	S.	SE.	(¹)	SE.	N.	(¹)	S.	.....
Lathrop, Cal.....	SE.	SE.	SE.	SE.	W.	W.	W.	(¹)	NW.	W.	W.	S.	.....

¹ No record.

² Observations discontinued.

Directions from which the prevailing winds have been observed to blow at stations on the Central Pacific and Southern Pacific Railroads, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Lemoore, Cal.	NW.	NW.	S.	NW.	NW.	NW.	NW.	NW.	(1)	NW.	NW.	NW.	.....
Livermore, Cal.	E.	SW.	SW.	SW.	W.	W.	W.	W.	W.	W.	SW.	SW.	.....
Lordsburg, N. Mex.	SE.	SE.	SE.	SW.	SW.	SE.	SE.	SE.	SE.	W.	W.	SE.	SE.
Los Angeles, Cal.	NW.	SW.	SE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Mammoth Tank, Cal.	NE.	NE.	SW.	SW.	SW.	NE.	NE.	SW.	NE.	NW.	(1)	SW.	.....
Maricopa, Ariz.	(1)	W.	W.	W.	W.	E.	E.	E.	E.	E.	E.	E.	.....
Martinez, Cal.	SW.	W.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	N.	SW.
Mayville, Cal.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Menlo Park, Cal.	NW.	N.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	(1)	NW.	NW.	.....
Merced, Cal.	N.	N.	S.	N.	N.	N.	N.	N.	N.	N.	N.	S.	N.
Modesto, Cal.	S.	S.	S.	NW.	NW.	NW.	N.	(1)	N.	N.	S.	S.	.....
Mojave, Cal.	(1)	NW.	SW.	SE.	SE.	SE.	SE.	SE.	(1)	NW.	(1)	(1)	.....
Monterey, Cal.	SE.	NW.	S.	NW.	NW.	NW.	NW.	NW.	NW.	SW.	SE.	SE.	NW.
Napa City, Cal.	NW.	SE.	W.	W.	W.	SW.	NW.	W.	(1)	S.	S.	S.	.....
Needles, Ariz.	NW.	S.	NW.	NW.	NW.	SE.	E.	SE.	SE.	(2)	.....	.....	.....
Newhall, Cal.	NE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.
Nilea, Cal.	SE.	NE.	SW.	SE.	W.	SW.	W.	NW.	NW.	NW.	NW.	NW.	NW.
Oakland, Cal.	S.	W.	W.	W.	W.	W.	W.	W.	W.	W.	N.	W.	W.
Ogden City, Utah.	S.	S.	S.	E.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Orland, Cal.	N.	N.	N.	S.	S.	S.	SE.	N.	N.	N.	N.	N.	.....
Oro, Nev.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Pajaro, Cal.	(1)	E.	SW.	(1)	W.	S.	SW.	(1)	S.	W.	W.	SW.	.....
Pala, Nev.	W.	W.	N.	N.	W.	W.	SW.	S.	SW.	SE.	SE.	W.	.....
Pantano, Ariz.	E.	E.	E&W	E.	E.	(1)	W.	W.	E.	E.	E.	E.	.....
Petaluma, Cal.	SE.	W.	W.	W.	W.	W.	W.	W.	(1)	W.	E.	E.	.....
Pleasanton, Cal.	S.	S.	S.	S.	SW.	S.	S.	S.	S.	S.	S.	S.	S.
Promontory, Utah.	NE.	NE.	NE.	NE.	NE.	SW.	SW.	S.	SW.	SW.	(1)	SW.	.....
Ravenna, Cal.	NE.	NE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	SW.
Red Bluff, Cal.	N.	N.	N.	S.	S.	S.	S.	S.	S.	N.	N.	N.	N.&S.
Redding, Cal.	(1)	(1)	(1)	SW.	SW.	SW.	SW.	(1)	SW.	N.	(1)	N.	.....
Reno, Nev.	E.	SW.	SW.	SW.	N.	SW.	W.	W.	W.	W.	W.	SW.	W.
Rocklin, Cal.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	(1)	SE.	(1)	SE.	SE.
Sacramento, Cal.	N.	N.	S.	S.	S.	S.	S.	S.	S.	S.	N.	S.	S.
Salinas, Cal.	S.	S.	S.	S.	W.	S.	W.	W.	S.	S.	W.	S.	S.
San Fernando, Cal.	S.	S.	S.	S.	S.	(1)	S.	SE.	SW.	S.	N.	N.	.....
San José, Cal.	S.	S.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	(1)	NW.	NW.	.....
San Mateo, Cal.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	.....
San Simon, Ariz.	E.	E.	W.	W.	W.	W.	W.	E&W	E.	E.	W.	W.	W.
Santa Cruz, Cal.	NE.	NE.	NE.	N.	S.	S.	N.	SE.	N.	N.	N.	S.	N.
Soledad, Cal.	S.	S.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	S.	NW.	NW.
Soquel, Cal.	N.	N.	N.	N&S.	N.	N.	N.	(1)	N.	N.	N.	N.	.....
South Vallejo, Cal.	SE.	SW.	SE.	W.	SW.	SW.	SW.	SW.	(1)	SW.	SE.	SW.	.....
Spadra, Cal.	N.	E.	S.	W.	W.	N.	W.	S.	S.	W.	W.	N.	W.
Stockton, Cal.	SE.	SE.	S.	SE.	W.	NW.	W.	W.	W.	W.	W.	SE.	W.
Suisun, Cal.	NE.	NE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Summit, Cal.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Sumner, Cal.	N.	N.	N.	N.	N.	N.	W.	W.	S.	W.	W.	S.	N.
Tecoma, Nev.	W.	W.	W.	SW.	W.	W.	W.	W.	(1)	N.	N.	N.	.....
Tehama, Cal.	N.	N.	N.	(1)	S.	S.	S.	S.	(1)	N.	N.	N.	.....
Tehachas, Cal.	SE.	SE.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	NE.	NW.
Tennant, Cal.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Terrace, Utah.	NW.	NW.	NW.	W.	W.	W.	W.	SW.	W.	(1)	N.	W.	W.
Texas Hill, Ariz.	N.	S.	W.	W.	W.	S&W	E.	S.	S.	W.	E.	SW.	W&S
Toano, Nev.	S.	S.	SW.	S.	S.	W.	W.	W.	W.	W.	W.	W.	W.
Tracy, Cal.	S.	W.	S.	S.	W.	W.	W.	W.	W.	W.	W.	W.	W.
Truckee, Cal.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	(1)	SW.	NW.	NW.	.....
Tucson, Ariz.	SW.	W.	E.	SE.	S.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.
Tulare, Cal.	S.	N.	SW.	S.	NW.	NW.	NW.	NW.	NW.	NW.	SE.	S.	NW.
Turlock, Cal.	SW.	S.	S.	S.	N.	N.	N.	N.	N.	N.	N.	N.	N.
Wadsworth, Nev.	SE.	N.	W.	W.	N.	W.	W.	S.	S.	N.	E.	SW.	SW.
Wells, Nev.	SW.	W.	SW.	S.	SW.	SW.	W.	SW.	W.	W.	W.	W.	W.
Willcox, Ariz.	N.	W.	W.	W.	W.	W.	E.	E.	W.	E.	E.	W.	W.
Williams, Cal.	N.	N.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Willow, Cal.	N.	S.	S.	S.	S.	S.	S.	W.	W.	W.	W.	W.	W.
Winnemucca, Nev.	SE.	SE.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	SW.	SW.
Woodland, Cal.	N.	N.	N.	N.	S.	S.	S.	N.	(1)	SW.	S.	N.	.....
Yuma, Ariz.	NE.	NE.	W.	W.	NW.	(1)	SE.	NW.	(1)	SW.	SE.	(1)	.....

¹ No record.

² Observations discontinued.

APPENDIX 51.

Directions from which the prevailing winds have been observed to blow at stations of the Signal Service, United States Army, during each month of the year. (Computed from the commencement of observations at each to and including December, 1884.)

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
New England:												
Eastport, Me.	NW.	NW.	NW.	S.	S.	S.	S.	S.	S.	NW.	NW.	NW.
Portland, Me.	NW.	NW.	NW.	NW.	S.	S.	S.	S.	S.	NW.	NW.	NW.
Mt. Washington, N.H.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Boston, Mass.	NW.	NW.	NW.	NW.	SW.	SW.	SW.	W.	SW.	W.	W.	W.
Block Island, R. I.	N.	NW.	NW.	SW.	SW.	SW.	SW.	SW.	SW.	NW.	NW.	NW.
New Haven, Conn.	NW.	NW.	NW.	NW.	S.	S.	S.	S.	SW.	SW.	NW.	NW.
New London, Conn.	NW.	NW.	NW.	NW.	SW.	SW.	SW.	SW.	N.	N.	NW.	NW.
Middle Atlantic States:												
Albany, N. Y.	S.	NW.	NW.	NW.	S.	S.	S.	S.	S.	NW.	NW.	NW.
New York City.	N.	NW.	NW.	NW.	SW.	SW.	SW.	SW.	SW.	NW.	NW.	NW.
Philadelphia, Pa.	NW.	NW.	NW.	NW.	SW.	SW.	SW.	SW.	SW.	NW.	NW.	NW.
Atlantic City, N. J.	NW.	NW.	NW.	NW.	S.	S.	S.	S.	S.	NW.	NW.	NW.
Barnegat City, N. J.	NW.	NW.	NW.	NW.	S.	S.	S.	S.	SW.	NW.	NW.	NW.
Capo May, N. J.	NW.	NW.	NW.	NW.	S.	S.	S.	S.	S.	NW.	NW.	NW.
Sandy Hook, N. J.	W.	NW.	NW.	NW.	SE.	SE.	SW.	SW.	SW.	NW.	NW.	NW.
D. I. Breakwater, Del.	NW.	NW.	NW.	NW.	NE.	SW.	S.	NE.	SW.	NW.	NW.	NW.
Baltimore, Md.	NW.	NW.	NW.	NW.	SE.	S.	SW.	S.	N.	NW.	NW.	NW.
Washington City.	NW.	NW.	NW.	NW.	S.	S.	S.	S.	S.	NW.	NW.	NW.
Cape Henry, Va.	NW.	N.	NW.	S.	SE.	SE.	SW.	NE.	NE.	NW.	NW.	NW.
Chincoteague, Va.	NW.	NW.	NW.	NW.	S.	S.	S.	NE.	N.	S.	NW.	NW.
Lynchburg, Va.	SW.	NW.	NW.	NE.	S.	SW.	SW.	NE.	NE.	W.	SW.	SW.
Norfolk, Va.	N.	NE.	N.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	N.	N.
South Atlantic States:												
Charlotte, N. C.	(NE) SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	SW.	SW.
Hatteras, N. C.	SW.	NE.	NE.	NE.	NE.	SW.	SW.	NE.	NE.	NE.	NE.	NE.
Kitty Hawk, N. C.	SW.	NE.	NE.	NE.	NE.	SW.	SW.	NE.	NE.	NE.	NE.	NE.
Macon, Fort, N. C.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	N.	N.	N.
Smithville, N. C.	N.	N.	SW.	SW.	SW.	SW.	SW.	SW.	N.	N.	N.	N.
Wilmington, N. C.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	SW.
Charleston, S. C.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	NE.
Augusta, Ga.	NW.	NW.	NW.	NW.	SE.	S.	SE.	NE.	NE.	NW.	NW.	NW.
Savannah, Ga.	NW.	NW.	S.	SW.	S.	SW.	SW.	SW.	NE.	NE.	N.	NW.
Jacksonville, Fla.	NE.	NE.	SW.	SW.	NE.	SW.	SW.	NE.	NE.	NE.	NE.	NE.
Florida Peninsula:												
Cedar Keys, Fla.	NE.	NE.	(SW) W.	SW.	W.	W.	W.	NE.	NE.	NE.	NE.	NE.
Key West, Fla.	NE.	E.	E.	E.	E.	E.	E.	E.	E.	NE.	NE.	NE.
Sanford, Fla.	NW.	SE.	SW.	SW.	SW.	E.	SW.	NE.	NE.	NE.	NE.	NE.
Eastern Gulf States:												
Atlanta, Ga.	NW.	NW.	NW.	NW.	E.	NW.	W.	E.	E.	E.	NW.	NW.
Pensacola, Fla.	N.	SE.	S.	S.	SE.	SW.	SW.	S.	SE.	NE.	N.	N.
Mobile, Ala.	N.	N.	S.	S.	S.	S.	S.	S.	N.	N.	N.	N.
Montgomery, Ala.	NW.	NW.	NW.	S.	SE.	SE.	SW.	E.	E.	E.	NW.	NW.
Vicksburg, Miss.	N.	SE.	S.	S.	SE.	SW.	SW.	SE.	N.	N.	SE.	SE.
New Orleans, La.	N.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	E.	E.	N.	N.
Western Gulf States:												
Shreveport, La.	S.	S.	S.	S.	S.	S.	S.	SE.	SE.	SE.	S.	S.
Fort Smith, Ark.	E.	E.	E.	E.	E.	E.	E.	E.	E.	E.	E.	E.
Little Rock, Ark.	NW.	NW.	NW.	S.	S.	S.	SW.	NE.	NE.	SE.	S.	NW.
Galveston, Tex.	N.	SE.	NE.	SE.	SE.	S.	S.	SE.	SE.	SE.	N.	N.
Indianola, Tex.	N.	S.	SE.	S.	SE.	S.	S.	S.	SE.	SE.	N.	N.
Palestine, Tex.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Rio Grande Valley:												
Brownsville, Tex.	N.	S.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	N.	N.
Rio Grande City, Tex.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	SE.
Ohio Valley and Tennessee:												
Chattanooga, Tenn.	NE.	S.	NW.	SW.	S.	SW.	SW.	NE.	NE.	NE.	S.	S.
Knoxville, Tenn.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.	NE.	NE.	SW.
Memphis, Tenn.	NW.	NW.	SE.	SE.	SE.	SW.	SW.	NW.	NW.	NW.	NW.	NW.

Directions from which the prevailing winds have been observed to blow at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Ohio Valley and Tennessee—Continued:												
Nashville, Tenn.....	NW.	NW.	NW.	NW.	S.	W.	W.	NW.	NW.	SE.	NW.	NW.
Louisville, Ky.....	SW.	S.	W.	S.	S.	S.	SW.	N.	S.	S.	S.	W.
Indianapolis, Ind.....	W.	NW.	NW.	NW.	SE.	SW.	SW.	N.	S.	S.	S.	W.
Cincinnati, Ohio.....	SW.	NW.	NW.	NW.	SE.	SE.	SW.	NE.	SE.	SE.	SE.	NW.
Columbus, Ohio.....	S.	W.	{NW}	W.	S.	SW.	S.	{N. S.}	S.	S.	S.	W.
Pittsburg, Pa.....	W.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	W.	W.
Lower Lakes:												
Buffalo, N. Y.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	W.	W.
Oswego, N. Y.....	{SE. S.}	{S. NW}	NW.	W.	W.	W.	W.	S.	S.	S.	S.	S.
Rochester, N. Y.....	W.	W.	W.	W.	W.	W.	W.	SW.	SW.	SW.	W.	W.
Erie, Pa.....	SW.	W.	W.	NE.	W.	S.	W.	S.	S.	S.	S.	SW.
Cleveland, Ohio.....	SW.	W.	W.	NE.	SE.	SE.	N.	SE.	SE.	SE.	SW.	SW.
Sandusky, Ohio.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Toledo, Ohio.....	SW.	SW.	W.	W.	{NE. SW}	SW.	SW.	SW.	S.	SW.	SW.	SW.
Detroit, Mich.....	SW.	W.	NW.	NE.	SW.	SW.	SW.	SW.	SW.	SW.	W.	SW.
Upper Lakes:												
Alpena, Mich.....	W.	W.	NW.	NW.	NW.	SE.	NW.	NW.	NW.	NW.	W.	W.
Escanaba, Mich.....	NW.	N.	N.	N.	S.	S.	S.	S.	S.	S.	W.	W.
Grand Haven, Mich.....	W.	W.	NW.	NW.	SW.	SW.	SW.	SW.	S.	S.	W.	W.
Mackinaw City, Mich.....	W.	W.	NW.	E.	W.	W.	W.	NW.	W.	NW.	NW.	NW.
Marquette, Mich.....	W.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	W.	W.	W.	W.
Port Huron, Mich.....	S.	S.	N.	N.	NE.	S.	S.	NE.	S.	S.	SW.	SW.
Chicago, Ill.....	SW.	SW.	NW.	N.	N.	SW.	SW.	NE.	SW.	SW.	SW.	SW.
Milwaukee, Wis.....	NW.	NW.	NW.	NE.	NE.	SW.	SW.	SW.	SW.	SW.	NW.	W.
Duluth, Minn.....	SW.	NE.	NE.	NE.	NE.	NE.	NE.	NE.	NE.	NE.	SW.	SW.
Upper Mississippi Valley:												
Saint Paul, Minn.....	NW.	SE.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	SE.	NW.	NW.
La Crosse, Wis.....	S.	S.	N.	N.	S.	S.	S.	S.	S.	S.	S.	S.
Davenport, Iowa.....	NW.	NW.	NW.	NW.	E.	SW.	SW.	SW.	SW.	SW.	NW.	NW.
Des Moines, Iowa.....	N.	NW.	N.	N.	SW.	S.	SW.	SW.	SW.	S.	NW.	NW.
Dubuque, Iowa.....	NW.	NW.	NW.	NW.	SE.	SE.	S.	S.	S.	NW.	NW.	NW.
Keokuk, Iowa.....	NW.	NW.	NW.	NE.	S.	S.	SW.	S.	S.	S.	NW.	NW.
Cairo, Ill.....	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Springfield, Ill.....	S.	NW.	NW.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Saint Louis, Mo.....	S.	NW.	NW.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Missouri Valley:												
Leavenworth, Kans.....	S.	S.	N.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Omaha, Nebr.....	NW.	N.	N.	N.	SE.	S.	S.	S.	S.	S.	NW.	NW.
Bennett, Fort, Dak.....	NW.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	SE.	SE.	NW.	NW.
Huron, Dak.....	NW.	NW.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	SE.	NW.	NW.
Yankton, Dak.....	NW.	NW.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	NW.	NW.	NW.
Extreme Northwest:												
Moorhead, Minn.....	N.	N.	N.	N.	N.	S.	S.	SE.	S.	SE.	S.	N.
Saint Vincent, Minn.....	NW.	NW.	NW.	NW.	NW.	S.	NW.	NW.	NW.	NW.	NW.	NW.
Bismarck, Dak.....	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Buford, Fort, Dak.....	NW.	W.	NW.	E.	E.	E.	E.	E.	W.	W.	W.	W.
Northern Slope:												
Aassinaboine, Fort, Mont.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Benton, Fort, Mont.....	W.	SW.	W.	NE.	W.	W.	SW.	W.	SW.	SW.	SW.	SW.
Custer, Fort, Mont.....	SE.	SW.	SE.	NW.	E.	NW.	SE.	SE.	N.	N.	SE.	N.
Helena, Mont.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Maginnis, Fort, Mont.....	W.	W.	W.	W.	W.	W.	SW.	NW.	NW.	NW.	W.	W.
Poplar River, Mont.....	NW.	NW.	NW.	SW.	SE.	SW.	NW.	SE.	W.	W.	W.	NW.
Shaw, Fort, Mont.....	SW.	SW.	W.	W.	W.	W.	W.	W.	W.	W.	W.	SW.
Deadwood, Dak.....	SW.	SW.	SW.	NE.	{NE. SW}	SW.	SW.	NE.	NE.	NE.	SW.	NE.
Cheyenne, Wyo.....	W.	W.	NW.	NW.	NW.	NW.	S.	NW.	NW.	NW.	NW.	NW.
North Platte, Nebr.....	NW.	NW.	NW.	NW.	SE.	SE.	SE.	SE.	SE.	NW.	NW.	NW.
Middle Slope:												
Denver, Colo.....	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Pike's Peak, Colo.....	SW.	W.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	W.	W.
West Las Animas, Colo.....	W.	W.	E.	W.	E.	E.	E.	E.	S.	NE.	NW.	W.
Dodge City, Kans.....	N.	N.	N.	N.	S.	S.	S.	S.	H.	S.	N.	N.
Elliot, Fort, Tex.....	N.	S.	NE.	S.	SE.	S.	SE.	SE.	S.	SE.	NW.	N.
Southern Slope:												
Ball, Fort, Ind. T.....	N.	N.	N.	S.	S.	S.	SE.	SE.	S.	S.	N.	N.
Cochise, Fort, Tex.....	SW.	S.	S.	S.	S.	S.	S.	S.	S.	S.	S.	SW.
Davis, Fort, Tex.....	SW.	SW.	SW.	SW.	SW.	SW.	E.	E.	NE.	SW.	SW.	SW.
Stockton, Fort, Tex.....	SW.	SW.	SW.	SE.	SE.	SE.	SE.	SE.	S.	SW.	SW.	SW.

Directions from which the prevailing winds have been observed to blow at stations of the Signal Service, United States Army, &c.—Continued.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Southern Plateau:												
Santa Fé, N. Mex.....	N.	N.	SW.	SW.	{ E. SW.	{ SW. E.	E.	E.	E.	SW.	N.	N.
El Paso, Tex.....	W.	W.	W.	W.	E.	W.	W.	E.	W.	W.	W.	W.
Apache, Fort, Ariz.....	NE.	SW.	NE.	SW.	E.	E.	E.	E.	NE.	NE.	NE.	NE.
Grant, Fort, Ariz.....	NE.	N.	N.	NW.	NW.	N.	N.	E.	N.	N.	N.	N.
Prescott, Ariz.....	SW.	S.	S.	S.	S.	S.	S.	S.	S.	S.	SW.	S.
Thomas, Camp, Ariz.....	SE.	NW.	W.	W.	W.	NW.	NW.	SE.	SE.	SE.	SE.	SE.
Yuma, Ariz.....	N.	N.	W.	W.	W.	SW.	SE.	SE.	SW.	NE.	N.	N.
Middle Plateau:												
Winnemucca, Nev.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	NE.
Salt Lake City, Utah.....	SE.	SE.	SE.	NW.	NW.	NW.	NW.	SE.	NW.	NW.	NW.	NW.
Northern Plateau:												
Boisé City, Idaho.....	SE.	SE.	SE.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.	NW.
Lewiston, Idaho.....	E.	E.	E.	W.	W.	NE.	NE.	NE.	NE.	NE.	E.	E.
Dayton, Wash.....	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.
Spokane Falls, Wash.....	{ NE SW }	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	SW.	NE.	SW.
North Pacific Coast:												
Canby, Fort, Wash ..	E.	N.	W.	W.	W.	W.	W.	W.	S.	S.	S.	SE.
Olympia, Wash.....	S.	S.	S.	S.	S.	{ N. SW. }	N.	N.	S.	S.	S.	S.
Tatoosh Island, Wash	E.	E.	E.	E.	{ SW. W. }	{ SW. SW. }	SW.	SW.	E.	E.	E.	E.
Portland, Oreg.....	S.	S.	S.	S.	NW.	NW.	NW.	NW.	S.	S.	S.	S.
Roseburg, Oreg.....	SW.	NW.	SW.	NW.	NW.	N.	N.	N.	NW.	NW.	SW.	SW.
Middle Pacific Coast:												
Cape Mendocino, Cal.	NW.	NW.	SE.	NW.	NW.	NW.	NW.	N.	N.	N.	SE.	NW.
Red Bluff, Cal.....	N.	N.	S.	S.	S.	S.	S.	S.	N.	N.	N.	N.
Sacramento, Cal.....	SE.	SE.	S.	S.	SW.	S.	S.	S.	S.	S.	N.	SE.
San Francisco, Cal....	N.	W.	W.	W.	W.	SW.	SW.	SW.	SW.	SW.	NW.	N.
South Pacific Coast:												
Los Angeles, Cal.....	NE.	NE.	W.	W.	W.	W.	W.	W.	W.	W.	NE.	NE.
San Diego, Cal.....	NE.	NW.	W.	W.	W.	W.	W.	W.	NW.	NW.	NW.	NE.
Alaska Stations:												
Saint Michael's, Fort, Alaska.....	NE.	NE.	NE.	NE.	N.	N.	S.	S.	N.	NE.	NE.	NE.
Sitka, Alaska.....	E.	E.	E.	E.	E.	SW.	W.	SW.	E.	E.	E.	E.
Unalakshka, Alaska..	SE.	SE.	SE.	SE.	SW.	SE.	SW.	SW.	SW.	SW.	SW.	SE.



APPENDIX 52.

Meteorological summary for the year ending December 31, 1894.

ALBANY, N. Y.

Location of office on December 31, 1894, United States custom-house.

[Latitude, 42° 39' N.; longitude, 73° 45' W. Elevation of barometer above sea-level, 83 feet. Elevation of exposed thermometer above ground, 80 feet. Elevation of rain-gauge above ground, 100 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	Washington time.			Monthly mean.			Highest.			Lowest.			Date.			Range.			Washington time.			Self-registering thermometers.			Mean maximum.			Mean minimum.			Total amount.			Any 3 consecutive 8-hourly measurements.			Maximum hourly velocity during month.			Prevailing direction.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

§ December.

† August.

‡ January.

ALBANY, N. Y.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).						Number of days—															
	North. Northeast. East. Southeast. South. Southwest. West. Northwest. Number of calms.								7 a. m. 3 p. m.		11 p. m. Mean.		7 a. m. 3 p. m.		11 p. m. Mean.		7 a. m. 3 p. m.		11 p. m. Mean.		Clear.		Fair.		Cloudy.		On which .01 inch or more precipitation fell.		Maximum below 32°. Minimum below 32°.		Maximum above 32°. Thunder-storms.		Aurora.	
1884.	21	13	2	0	26	9	12	10	0	0	0	11.9	64.2	54.3	65.1	61.2	7.5	7.8	6.1	7.0	2	14	15	12	14	30	0	0	0	0	0	0		
Jan.....	21	13	2	0	26	9	12	10	0	0	0	11.9	64.2	54.3	65.1	61.2	7.5	7.8	6.1	7.0	2	14	15	12	14	30	0	0	0	0	0	0		
Feb.....	16	8	2	3	21	6	14	15	7	23.7	22.1	23.6	23.1	72.5	70.5	67.4	8.3	8.8	7.2	8.1	1	9	19	20	4	21	0	0	0	0	0	0		
Mar.....	19	8	3	0	17	5	21	20	0	23.8	25.7	37.0	25.5	70.6	57.9	72.0	66.8	7.0	6.7	5.4	6.4	5	14	12	17	6	17	0	0	0	0	0		
Apr.....	24	8	3	2	12	2	16	23	0	33.8	33.5	37.0	33.8	67.5	49.8	67.3	61.5	6.8	6.2	5.9	6.4	6	11	13	9	0	0	0	0	0	0	0		
May.....	8	3	3	3	29	4	30	12	1	44.6	44.0	45.3	44.6	64.3	47.7	66.4	60.8	6.8	7.1	4.6	6.2	6	15	10	15	0	0	0	0	0	0	0		
June.....	26	2	3	3	1	41	0	14	2	55.9	54.9	56.8	55.9	65.7	44.1	66.1	53.6	4.1	3.1	3.8	6.5	15	9	6	9	0	0	1	4	0	0	0		
July.....	11	0	2	2	26	2	38	12	0	57.5	57.1	57.7	60.1	70.6	52.4	70.9	64.6	7.5	7.0	4.2	6.5	2	18	11	16	0	0	0	0	0	0	0		
Aug.....	16	8	0	3	42	4	13	10	2	60.1	59.9	60.5	60.2	75.9	53.2	71.5	66.9	5.2	6.4	5.0	5.3	3	10	13	8	9	0	0	3	4	0	0		
Sept.....	9	5	0	0	42	4	12	9	3	54.9	56.0	56.1	56.1	75.7	54.3	72.7	67.6	4.1	5.5	3.5	4.2	11	15	14	9	0	0	0	0	2	2	0		
Oct.....	25	6	2	0	10	80	2	17	1	87.7	87.4	88.6	87.9	70.9	49.4	66.8	62.4	6.1	6.2	5.5	5.9	6	12	13	11	0	0	2	0	2	2	0		
Nov.....	21	4	4	0	11	29	4	16	1	25.3	24.8	27.9	26.0	69.6	49.5	68.9	62.7	5.6	7.4	6.6	6.5	6	9	15	11	1	16	0	0	0	0	0		
Dec.....	21	17	2	0	10	20	3	19	1	18.5	20.4	20.8	19.9	76.1	66.0	76.0	72.7	6.5	7.5	7.4	7.1	2	14	15	14	9	24	0	0	0	0	0		
Means ..	217	72	32	14	287	115	179	165	17	444.9	448.7	463.5	452.4	847.0	837.7	834.2	773.2	75.1	80.2	64.0	73.2	72	153	141	152	34	111	5	24	2	2	2		
Percentages.																	Percentages.																	
19.8 6.6 2.9 1.3 36 10.5 16.3 15.0 1.4																	19.7 41.8 38.5 41.5 9.3 30.3 1.4 6.0 0.5																	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.13 a. m., 3.13 p. m., and 11.13 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.019 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.100; February, 0.100; March, 0.100; April, 0.099; May, 0.099; June, 0.099; July, 0.099; August, 0.099; September, 0.099; October, 0.099; November, 0.099; December, 0.100.

J. O. BARNES,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ALPENA, MICH.

Location of office on December 31, 1884, Fletcher and Dock streets.

[Latitude, 45° 5' N.; longitude, 83° 30' W. Elevation of barometer above sea-level, 609 feet. Elevation of exposed thermometer above ground, 55 feet. Elevation of rain-gauge above ground, 63 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.										
	Washington time.			Monthly mean.	Higheest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.						
	7 a. m.	3 p. m.	11 p. m.							Maximum.	Date.	Minimum.	Date.	Absolute range.	Miles.					Direction	Date.								
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Miles.	Direction	Date.	Miles.							
Jan.....	29.360	29.333	29.374	29.350	30.037	26	28.579	2	1.458	10.0	16.7	11.3	12.740.5	30	25	60.5	20.3	3.071.00	2	28	W.	8	7,474						
Feb.....	29.356	29.323	29.351	29.347	29.904	10	28.664	19	1.220	12.0	19.5	14.0	15.238.0	19	17	55.0	22.6	7.2	2.780.51	4,5	38	W.	20	6,788					
Mar.....	29.363	29.337	29.354	29.351	29.781	30	28.648	11	1.133	17.7	29.1	22.8	22.354.0	21	19	73.0	32.3	14.8	1.610.87	25,26	33	SW.	12	6,460					
Apr.....	29.318	29.285	29.296	29.300	29.835	21	28.539	15	1.306	83.9	42.5	35.6	37.866.0	25	20.5	64.5	45.4	30.5	0.750.61	15,16	35	SE.	27	7,505					
May.....	29.260	29.249	29.261	29.253	29.696	28	28.537	19	.829	45.3	53.0	47.2	48.580.3	23	30.2	3	50.1	57.8	40.7	3.270.87	4,5	34	W.	15	6,765				
June.....	29.442	29.412	29.405	29.420	29.811	14	29.085	24	.728	60.5	64.7	59.3	61.585.0	30	40.0	11	45.0	70.9	52.9	2.671.10	23,24	23	SE, E.	13	4,562				
July.....	29.222	29.200	29.221	29.214	29.475	8	28.842	5	.633	58.2	67.2	58.4	61.283.0	1	45.0	14	38.0	70.8	52.9	2.380.85	30,31	30	W.	5	5,959				
Aug.....	29.327	29.304	29.319	29.317	29.715	9	28.894	30	.821	58.1	68.0	60.0	62.091.2	20	39.0	9	52.2	70.4	53.9	2.601.88	20,30	24	W.	21	5,975				
Sept.....	29.231	29.268	29.323	29.316	29.850	18	28.704	24	1.155	55.9	67.4	58.2	60.582.0	9	35.0	23	58.0	70.6	51.6	4.832.30	29	48	W.	10	6,291				
Oct.....	29.396	29.347	29.363	29.368	29.896	14	29.021	5	.865	45.0	53.9	45.9	48.984.0	3	20.9	24	63.1	56.5	40.0	3.751.08	2	35	E.	2	7,769				
Nov.....	29.313	29.278	29.316	29.302	29.655	18	28.496	23	1.169	29.3	35.4	30.4	31.758.0	14	10.1	24	47.9	38.8	26.2	2.151.11	22,23	32	W.	23	6,931				
Dec.....	29.322	29.314	29.345	29.337	29.926	25	28.563	6	1.343	22.0	26.0	31.6	23.250.1	31	10.9	19	69.1	39.4	18.4	5.581.56	6	29	SW.	31	9,102				
Suma.....	352,013	351,685	351,926	351,870	.....	.....	12,748	447.9	542.4	464.8	455.4	.....	.....	.....	647.4	585.8	391.5	583.53	.....	.....	.....	.....	78,831		
Means.....	29.304	29.307	29.328	29.324	.....	.....	28.696	23	1.082	57.2	63.7	58.7	40.388.0	19	30.0	13	54.0	68.8	52.6	.....	.....	.....	.....	.....
																								: November.		: September.		: January.	

* November.

† September.

‡ January.

ALPENA, MICH.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Number of calms.	Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
												7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.34 a. m., 2.34 p. m., and 10.34 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.006 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.710; March, 0.700; April, 0.690; May, 0.680; June, 0.650; July, 0.640; August, 0.640; September, 0.650; October, 0.670; November, 0.700; December, 0.710.

REMARKS.—September 19, about 2.40 p. m., a slight earthquake shock was felt in the western part of this city. Shock lasted about 2 seconds. Vibration, S.W. to N.W.

JAMES J. FITZGERALD,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

APACHE, FORT, ARIZ.

Location of office on December 31, 1884, post quarters.

[Latitude, 32° 48' N.; longitude, 109° 57' W. Elevation of barometer above sea-level, 5,050 (B.) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.										
	Washington time.			Monthly mean.			Washington time.				Self-registering thermometer.			Mean maximum.		Any 3 consecutive 8 hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	Miles.								
	7 a. m.	3 p. m.	11 p. m.	Date.	Lowest.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Total amount.		Date.	Miles.			Direction from—							
																Lat.	Frost amount.												
1884.																													
Jan.....	25.071	25.040	25.066	25.059	25.309	1	24.840	9	.460	25.2	46.0	33.5	24.9	52.8	8	6.0	2	53.8	51.1	21.0	0.68	0.39	17	26	N.E.	10	E. N.E.	4,953	
Feb.....	24.979	24.955	24.987	24.974	25.241	22	24.875	6	.000	31.9	49.2	39.0	40.2	60.2	24	18.3	14	61.0	62.9	22.3	3.43	1.11	3,4	40	SW.	6	SW.	5,016	
Mar.....	24.927	24.910	24.932	24.923	25.105	13	24.863	23	.413	33.8	53.9	41.7	42.5	66.2	14	18.3	24	50.9	66.4	31.3	4.44	1.24	4	88	W.	10	SW.	5,836	
Apr.....	24.927	24.910	24.924	24.920	25.083	24	24.719	27	.804	33.0	60.9	46.6	47.7	77.0	9	24.8	2	52.2	64.9	32.9	1.67	0.06	17	86	SW.	10	SW.	5,808	
May.....	24.973	24.958	24.964	24.965	25.147	6	24.820	21	.837	41.6	69.7	55.4	55.6	85.3	9	31.0	2	54.3	75.3	39.5	1.31	0.90	13	19	SW.	20	E	5,096	
June.....	25.007	24.982	24.994	24.994	25.137	28	24.877	6	.280	47.7	80.5	63.6	63.9	95.3	25	38.1	15	57.2	85.6	45.7	2.35	1.00	14	28	SW.	10	E	4,815	
July.....	25.038	25.000	25.038	25.043	25.099	10	24.940	4	.159	58.5	98.0	74.2	73.9	102.0	27	47.0	19	55.0	94.5	55.8	0.14	0.08	10	33	N.E.	30	E	4,719	
Aug.....	25.079	25.060	25.076	25.073	25.178	4	24.943	18	.229	56.6	90.4	69.6	67.9	97.1	4	42.5	21	54.6	95.1	53.9	5.59	1.76	23	32	N.W.	20	E	3,819	
Sept.....	25.047	25.020	25.036	25.034	25.202	20	24.799	30	.607	48.9	75.5	58.6	61.0	88.0	20	33.0	28	53.0	90.0	45.7	1.50	1.20	14	26	SW.	26	E	4,202	
Oct.....	25.065	25.038	25.064	25.056	25.238	16	24.716	1	.567	46.9	69.1	54.6	56.9	85.3	5	27.0	28	53.3	72.5	43.9	2.02	0.71	24	26	S.	18	N.E.	4,813	
Nov.....	25.114	25.077	25.117	25.105	25.238	30	24.803	21	.489	31.2	60.1	41.1	44.1	73.5	1	16.7	19	56.8	63.5	27.7	0.82	0.43	8,9	24	N.E.	29	E	3,295	
Dec.....	24.968	24.956	24.964	24.976	25.304	1	24.611	27	.698	25.0	43.6	33.1	33.9	63.6	2	—	8.0	15	71.6	47.3	5.52	1.33	27	33	N.E.	4	E	3,664	
Sums.....	300.235	299.335	300.192	300.121	5,004	482.2	776.9	603.6	622.6
Means.....	25.020	24.995	25.016	25.010	25.309	*1	24.875	16	.422	40.2	64.7	50.7	51.9	102.0	13.7	—	8.0	51.5	66.7	37.3

* January.

† February.

‡ July.

§ December.

APACHE, FORT, ARIZ.—Continued.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.48 a. m., 12.48 p. m., and 8.48 p. m., local time.

Correction for instrumental error of barometer used: From 4.48 a. m., January 1, to 8.48 p. m., December 31, 1884, inclusive, +.008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 5.120; February, 5.100; March, 5.020; April, 4.920; May, 4.820; June, 4.760; July, 4.740; August, 4.720; September, 4.800; October, 4.900; November, 5.100; December, 5.080.

W. S. MAYERS,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ASSINABOINE, FORT, MONT.

Location of office on December 31, 1884, post quarters.

[Latitude, 49° 32' N., longitude, 109° 42' W. Elevation of barometer above sea-level, 2,729 (B.) feet. Elevation of exposed thermometer above ground, 14 feet. Elevation of rain-gauge above ground, 4 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Washington time.					Monthly mean.	Washington time.					Self-registering ther- mometers.				Mean maximum.	Mean minimum.	Total amount.	Any 3 con- secutive 8-hourly measure- ments.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Date.		Lowest.	Range.	7 p. m.	3 p. m.	11 p. m.	Date.	Maximum.	Minimum.	Date.					Absolute range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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§ December.

‡ June.

† February.

* January.

ASSINABOINE, FORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.		7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	
1894.	10	4	10	24	2	4	25	15	3	2.6	3.4	6.8	0	6.6	76.0	75.7	74.2	74.3	4.1	4.1	2.7	4.0	10	10	2	2	19	26	0	0	0	0
Jan.....	4	2	5	11	1	3	22	18	14	17	12.4	20.6	17.8	16.9	84.7	80.2	80.7	84.3	4.6	4.6	3.4	3.8	9	17	2	14	22	30	0	0	0	0
Feb.....	2	5	11	13	7	3	17	8	12	27.8	30.1	28.8	28.7	81.4	78.1	80.5	81.1	3.0	3.0	2.1	2.2	15	17	2	14	22	30	0	0	0	0	
Mar.....	1	14	13	17	8	12	17	8	12	36.6	38.6	40.8	38.7	67.5	63.8	64.4	66.5	2.8	2.8	2.3	3.8	15	17	2	14	22	30	0	0	0	0	
Apr.....	1	16	10	16	1	8	18	20	7	44.9	48.7	51.1	48.2	65.0	60.3	60.1	57.2	3.5	4.2	3.8	3.8	12	15	2	14	22	30	0	0	0	0	
May.....	0	6	14	10	1	8	18	20	7	44.9	48.7	51.1	48.2	65.0	60.3	60.1	57.2	3.5	4.2	3.8	3.8	13	16	2	14	22	30	0	0	0	0	
June.....	0	9	0	18	0	3	26	29	8	46.2	48.3	51.8	48.8	76.6	74.6	74.6	60.8	2.8	3.1	2.6	3.8	10	16	2	14	22	30	0	0	0	0	
July.....	0	9	0	18	0	3	26	29	8	46.2	48.3	51.8	48.8	76.6	74.6	74.6	60.8	2.8	3.1	2.6	3.8	10	16	2	14	22	30	0	0	0	0	
Aug.....	8	12	4	9	1	10	20	32	2	46.2	48.3	51.8	48.8	76.6	74.6	74.6	60.8	2.8	3.1	2.6	3.8	17	12	2	14	22	30	0	0	0	0	
Sept.....	8	18	3	2	9	13	24	15	84.2	83.8	87.4	85.1	85.1	70.9	68.4	63.7	60.3	4.7	5.9	5.4	5.3	7	12	2	14	22	30	0	0	0	0	
Oct.....	8	5	13	7	5	16	26	17	1	25.4	24.2	25.2	25.2	60.9	58.5	49.4	48.6	4.2	5.0	3.9	4.4	12	12	2	14	22	30	0	0	0	0	
Nov.....	0	8	9	3	4	41	16	8	1	22.0	23.0	23.2	23.2	63.7	60.1	63.2	59.8	3.3	4.9	6.2	3.5	14	11	5	14	21	28	0	0	0	0	
Dec.....	0	5	11	0	1	44	12	14	0	10.1	5.7	8.1	8.0	68.7	60.1	63.2	59.8	4.9	4.9	6.2	3.5	15	15	7	14	21	28	0	0	0	0	
Sums ..	27	90	137	75	25	248	170	219	96	286.6	321.0	324.9	310.8	578.2	658.3	772.9	770.5	43.3	55.1	46.2	48.1	142	172	52	105	74	173	4	21	1	1	
Means ..	Percentages.																															
	2.5	9.0	12.5	6.8	2.8	23.2	15.5	19.9	8.9	22.9	23.8	27.1	25.9	73.2	54.9	64.5	64.2	3.6	4.6	3.8	4.0	38.5	47.0	14.2	28.7	20.2	47.2	1.1	5.7	0.3	0.3	
	Percentages.																															
	142	172	172	52	105	74	173	4	21	1																						

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.49 a. m., 12.49 p. m., and 8.49 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +0.13. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.05; February, 3.05; March, 3.02; April, 2.91; May, 2.85; June, 2.89; July, 2.74; August, 2.70; September, 2.89; October, 2.93; November, 2.99; December, 3.04.

REMARKS.—March. Lunar halos, 8, 9; polar bands, 10; aurora, 28. April. Last frost of season, 18; last snowfall, 27. May. Thunder-storms, 16, 27, influencing telegraph line. June. Thunder-storms, 4, 5, 10, 11, 13, 27, 28; hailstones an inch in diameter fell on the 13, 28. July. Thunder-storms, 7, 11, 15, 19, 24, 26, 27, 29; hailstones half an inch in diameter, 7; heavy monthly rainfall. August. Thunder-storms, 14, 21, 29; rapid changes of temperature, 26. September. First frost of season, 7; much sun, 7; thunder-storm, 14. October. First snowfall, 3; unusually high temperature, highest wind velocity ever observed at this station, 19; extensive prairie fires, 12, 13; hot withering winds, November. High temperature, prairie fire, 22, 24, 25.

J. J. O'CONNOR,
Private, Signal Corps, U. S. A.

ATLANTA, GA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.			Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.	Thunder-storms.	Auroras.				
1884.																														
Jan.....	9	1	1	6	10	9	15	37	0	25.6	26.7	26.9	26.4	81.2	53.6	72.0	70.9	5.4	5.8	5.8	3.7	4	13	0	1	0				
Feb.....	4	1	1	5	10	16	10	22	0	36.5	37.9	38.2	37.5	72.0	53.1	61.0	63.0	4.2	3.9	2.6	5.8	4	14	0	1	0				
Mar.....	4	2	3	16	11	17	16	33	0	40.8	41.7	41.2	41.2	75.2	54.1	66.2	65.8	5.7	5.5	4.4	5.2	10	10	4	0	0				
Apr.....	4	1	9	13	2	11	17	33	0	43.4	40.1	42.8	41.8	70.4	46.7	60.9	59.3	4.6	5.1	4.5	4.7	13	13	0	0	0				
May.....	2	1	12	10	6	7	26	29	0	55.0	53.5	55.6	54.7	83.1	45.9	60.4	59.4	4.2	4.9	2.9	4.0	13	14	0	0	0				
June.....	2	1	28	23	6	5	10	4	0	61.2	61.0	62.2	61.5	83.1	65.0	77.4	75.2	6.6	7.3	6.1	6.7	16	16	0	0	0				
July.....	7	5	2	11	4	4	11	18	0	67.0	65.7	68.3	67.0	82.7	57.1	73.8	71.0	4.1	5.2	2.6	4.0	0	0	0	0	0				
Aug.....	4	19	21	11	4	4	14	14	1	64.6	63.0	63.0	62.2	84.6	53.7	72.1	71.0	3.2	5.1	3.0	3.8	0	0	0	0	0				
Sept.....	9	14	19	25	13	8	4	9	0	60.1	57.6	59.2	59.3	78.3	43.7	61.2	63.1	2.0	3.7	1.5	2.4	0	0	0	0	0				
Oct.....	5	7	27	16	9	1	12	21	6	82.9	84.6	84.6	83.5	70.7	49.5	63.0	63.1	2.6	3.7	3.0	2.6	31	7	0	0	0				
Nov.....	9	3	15	6	3	8	5	18	0	84.4	84.6	84.6	83.5	71.1	49.5	63.0	63.1	2.6	3.7	3.0	2.4	16	9	0	0	0				
Dec.....	2	2	29	11	9	8	27	27	0	84.5	84.6	84.6	83.5	60.7	62.7	75.9	73.1	5.2	6.4	5.2	3.4	6	16	0	1	0				
Sums..	53	67	180	152	82	116	180	297	1	576.0	572.4	568.2	578.2	627.9	626.5	800.7	790.3	51.5	60.2	44.2	52.0	149	134	83	134	5	37	3	45	0
Percentages.																														
4.8 6.116.413.8 7.510.616.424.3 0.1																														
40.7 38.6 22.7 38.6 1.4 10.1 0.8 12.3 0																														
Means.																														

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.31 a. m., 2.31 p. m., and 10.31 p. m., local time.

Correction for instrumental error of barometer used: From 6.31 a. m., January 1, to 10.31 p. m., December 31, 1884, inclusive, + .005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.230; February, 1.220; March, 1.210; April, 1.190; May, 1.170; June, 1.150; July, 1.130; August, 1.110; September, 1.100; October, 1.090; November, 1.220; December, 1.230.

REMARKS.—The lowest temperature, -19.3, occurred January 6. Very destructive cyclone crossed the State February 19. Highest wind, 44 miles, on March 1. Damaging rain with hail April 14 and 15. Last frost of the season April 11. Greatest monthly rainfall in June, 10.73 inches. Severe drought in August, September, and October—73 days after August 9 without rain. Highest temperature, 90.8, October 3. First light frost October 24. First killing frost November 6. Greatest daily rainfall, 3.74 inches, December 14. Heavy sleet December 21.

S. W. BEALL,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ATLANTIC CITY, N. J.

Location of office on December 31, 1884, No. 10 Rhode Island avenue.

[Latitude, 39° 29' N.; longitude, 74° 29' W. Elevation of barometer above sea-level, 13 feet. Elevation of exposed thermometer above ground, 10 feet. Elevation of rain-gauge above ground, 37 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.					
Month.	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Any 3 consecutive 8-hourly measure-ments.		Maximum hourly velocity during month.		Prevailing direction.	Total movement.							
	7 p.m.	3 p.m.	11 p.m.	Range.	Date.	Lowest.	Highest.	Date.	Lowest.	Highest.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.			Mean minimum.	Total amount.	Date.	Amount.	Date.	Miles.	Direction.	Date.
1894.																									
Jan.....	30.113	30.001	30.105	30.103	30.909	37	30.187	9	1.642	23.9	32.0	14	4.0	7.4	46.0	35.8	21.7	7.17	1.51	8.9	26	SE	8	8 S.W.	
Feb.....	30.089	30.032	30.070	30.047	30.707	16	30.163	23	1.542	33.5	33.8	14	11.0	29	43.6	43.1	31.2	7.44	1.29	23	31	N.W.	20	8 E.	
Mar.....	30.016	29.935	30.006	29.992	30.447	16	30.474	20	.973	36.3	41.8	28	8.0	1.4	52.2	45.0	32.4	5.79	1.79	14	15	23	14	N.W.	
Apr.....	30.244	30.803	30.842	30.830	30.184	12	30.117	2	1.067	44.9	51.2	29	23.5	7	37.5	54.2	40.6	4.29	1.30	2	28	N.E.	3	8 N.W.	
May.....	30.944	30.912	30.942	30.923	30.296	31	30.582	11	.717	56.9	63.8	5	41.0	29	37.1	66.7	51.5	1.62	1.02	28	24	N.E.	7	3 S.W.	
June.....	30.006	30.033	30.046	30.035	30.457	15	30.724	9	.733	63.6	69.9	3	49.0	1	38.2	72.4	59.8	2.06	1.34	11	12	52	26	8 S.E.	
July.....	30.899	30.825	30.843	30.846	30.008	22	30.589	13	.423	68.5	75.1	68.2	56.9	31	32.3	77.9	63.8	4.73	2.21	29	24	E.	29	29 S.W.	
Aug.....	30.041	30.013	30.027	30.027	30.299	25	30.710	30	.580	69.7	75.0	69.8	71.5	88	27.5	77.3	65.9	4.04	1.47	5	37	E.	29	29 N.E.	
Sept.....	30.112	30.072	30.090	30.097	30.443	14	30.718	17	.723	66.8	74.6	67.8	49.7	14	36.5	76.0	63.3	2.34	1.18	12	37	S.W.	16	2 S.W.	
Oct.....	30.149	30.066	30.128	30.125	30.561	26	30.769	17	.802	55.7	63.3	4	32.4	36	50.6	63.8	50.8	2.94	1.93	22	23	25	2	2 N.W.	
Nov.....	30.083	30.041	30.048	30.061	30.451	22	30.872	28	1.079	41.0	50.7	44.6	45.4	62.9	2	49.9	54.5	4.03	1.90	20	24	42	23	3 S.W.	
Dec.....	30.178	30.118	30.130	30.139	30.612	20	30.576	6	1.037	38.0	40.4	37.2	37.5	61.0	7	36.9	44.4	7.71	2.11	21	32	32	12	8 N.W.	
Sum.....	30.459	30.085	30.277	30.249	30.419	20	30.419	12	1.111	61.8	68.0	51.0	51.0	71.3	31	71.3	54.0	54.70	74.233
Mean.....	30.088	30.001	30.028	30.021	30.506	27	30.117	12	.944	56.4	64.0	51.0	51.0	68.9	24	68.9	45.8	5 W.

1 January.

1 July.

1 December.

ATLANTIC CITY, N. J.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).	Number of days—																		
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.				Washington time.																		
													7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.							
1884.																															
Jan.....	18	15	5	2	3	19	14	16	1	20.4	25.4	21.1	22.3	76.8	76.9	74.0	75.9	6.6	7.9	5.6	6.7	4	13	14	15	9	26	0	0	0	0
Feb.....	19	14	24	4	6	13	8	19	0	32.2	33.8	31.8	32.6	85.1	80.6	84.0	83.2	5.7	4.7	5.3	5.9	5	16	18	13	1	13	0	0	0	0
Mar.....	15	9	9	11	3	10	11	18	7	31.3	34.7	33.9	33.1	82.7	78.8	84.4	82.4	5.6	7.5	4.8	6.3	6	14	11	10	3	10	0	0	0	0
Apr.....	16	2	17	9	5	4	17	18	2	37.9	40.7	38.6	39.1	77.9	82.0	79.3	75.2	4.2	6.4	4.7	4.1	6	16	8	10	0	1	0	0	0	0
May.....	7	7	17	16	13	17	13	8	3	50.0	50.3	49.7	50.4	79.2	83.5	80.3	73.2	4.2	4.2	3.2	3.2	11	12	8	0	0	0	0	0	0	0
June.....	3	15	15	13	11	14	4	10	6	60.0	61.7	54.5	60.4	81.0	83.3	80.3	73.0	2.8	3.4	3.5	3.2	18	15	8	0	0	0	0	0	0	0
July.....	2	4	9	11	21	22	14	3	2	62.2	63.5	63.7	63.0	86.7	86.7	86.4	83.9	2.3	3.3	3.6	4.8	13	15	8	0	0	0	0	0	0	0
Aug.....	12	21	15	11	14	12	3	3	0	61.3	64.4	63.1	62.9	83.0	83.7	83.7	80.1	2.2	2.2	0.7	1.6	11	11	9	10	0	0	0	0	0	0
Sept.....	3	10	10	4	15	39	3	6	0	49.1	51.1	50.9	50.4	79.6	81.6	81.6	76.0	3.9	3.9	2.9	2.9	23	16	3	0	0	0	0	0	0	0
Oct.....	11	13	3	8	12	20	16	21	0	38.5	41.2	39.9	39.2	84.9	84.9	84.9	80.1	3.7	4.2	2.3	2.7	13	12	6	10	0	0	0	0	0	0
Nov.....	8	9	10	4	7	17	16	17	2	36.5	41.2	39.9	39.2	84.9	84.9	84.9	80.1	3.7	4.2	2.3	2.7	9	10	12	7	3	14	0	0	0	0
Dec.....	12	12	7	2	6	16	17	20	1	30.4	34.2	32.8	32.5	84.1	79.8	83.0	83.0	3.1	6.3	3.4	3.6	9	10	12	7	3	14	0	0	0	0
Sums ..	115	131	131	92	118	200	130	148	33	536.5	567.7	530.5	551.6	894.3	881.2	1000.9	965.5	55.6	60.8	51.5	58.0	131	136	99	131	16	72	0	7	0	0
	Percentages.																														
Means.	10.5	11.9	11.9	8.4	10.7	18.2	11.3	13.5	3.0	44.7	47.3	45.9	46.0	82.0	78.4	83.4	79.6	4.6	5.1	4.3	4.7	35.8	37.2	27.0	35.8	4.4	19.7	0.1	9	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 7 11 a. m., 3 11 p. m., and 11 11 p. m. local time.

Correction for instrumental error of barometer used: From 7 11 a. m., January 1, to December 31, 1884, inclusive, —.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.01; February, 0.01; March, 0.01; April, 0.01; May, 0.01; June, 0.01; July, 0.01; August, 0.01; September, 0.01; October, 0.01; November, 0.01; December, 0.01.

REMARKS.—August 10, 2.07 p. m., three light shocks of earthquake were felt in this city which were of about three seconds duration, appeared to be from NE to SW.
B. A. BLUNDON,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

AUGUSTA, GA.

Location of office on December 31, 1884, Cotton Exchange Building, Reynolds street.

Latitude, 33° 28' N.; longitude, 81° 54' W. Elevation of barometer above sea-level, 183 feet. Elevation of exposed thermometer above ground, 19 feet. Elevation of rain-gauge above ground, 39 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																								
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Range.	Washington time.			Self-registering thermometers.			Total amount.	Largest amount.	Any 3 consecutive 8-hourly measurements.	Miles.	Direction from—	Maximum hourly velocity during month.	Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.	3 p. m.	11 p. m.						Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.								Mean maximum.		Mean minimum.																																																																																																																																																																																																																																																																																																																																																																							
1884.	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I_b</i>	<i>I_c</i>	<i>I_a</i>	<i>I</i>

* November.
† July.

* Three 7 a. m. observations missed.
† Two 7 a. m. observations missed.
‡ January.

! One 7 a. m. observation missed.
* One 7 a. m. and one 11 p. m. observation missed; does not include maximum and minimum and range.

Meteorological summary for the year ending December 31, 1884—Continued.

BALTIMORE, MD.

Location of office on December 31, 1884, Baltimore Fire Insurance Co.'s Office, corner South and Water streets.

[Latitude, 39° 19' N.; longitude, 76° 37' W. Elevation of barometer above sea-level, 45 feet. Elevation of exposed thermometer above ground, 33 feet. Elevation of rain-gauge above ground, 60 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.			Total movement.
	Washington time.			Monthly mean.			Washington time.				Self-registering thermometers.		Mean maximum.		Mean minimum.		Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.			
	7 a.m.	3 p.m.	11 p.m.	In.	Date.	Lowest.	Date.	Range.	Monthly mean.		Maximum.	Date.	Minimum.	Date.	Absolute range.	Total amount.	Largest amount.	Date.	Miles.	Direction.				
									7 a.m.	3 p.m.												11 p.m.		
1884.	In.	3 p.m.	11 p.m.	In.	Date.	Lowest.	Date.	Range.	7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	In.	Date.	Miles.	Direction.	
Jan.	30.162	30.066	30.124	30.124	30.081	27	28.214	8	1.617	23.9	34.9	32.2	32.062.0	0	14	8.0	6	44.0	38.0	25.0	In.	8	24	W.
Feb.	30.056	30.035	30.063	30.071	30.071	16	29.289	28	1.432	40.2	45.5	40.7	42.268.2	6	10.5	29	57.7	43.6	37.4	6.091.90	19	31	NW.	
Mar.	30.030	30.072	30.039	30.010	30.038	16	29.437	28	.851	40.5	48.5	43.1	44.064.5	26	14.0	1	50.5	50.2	37.4	6.871.48	23	28	NW.	
Apr.	30.084	30.017	29.875	29.830	30.194	12	29.179	2	1.019	48.1	53.0	50.8	52.879.7	28	24.0	9	45.7	50.8	45.2	2.651.31	29	26	NW.	
May	29.953	25.808	29.835	29.829	30.290	3	29.614	11	.666	60.9	71.4	63.1	64.839.0	24	44.9	29	44.1	72.8	55.9	3.170.74	28	18	NW.	
June	30.060	30.010	30.037	30.041	30.454	15	29.672	8	.792	68.1	80.1	76.8	73.262.6	22	32.3	16	40.2	81.8	64.4	2.513.30	13	14	SW.	
July	30.078	30.014	30.035	30.040	30.037	22	29.594	13	.443	70.9	82.3	73.0	73.262.6	22	33.9	9	35.2	83.4	67.6	4.532.75	11	32	NW.	
Aug.	30.040	30.093	30.027	30.090	30.459	14	29.678	30	.600	71.1	81.8	72.7	73.262.6	20	33.6	25	34.3	83.4	68.4	1.740.68	30	17	NW.	
Sept.	30.105	30.036	30.075	30.072	30.572	26	29.704	7	.748	63.8	80.5	76.0	72.192.6	10	33.4	18	43.3	81.4	63.4	1.090.08	30	18	N.	
Oct.	30.151	30.079	30.124	30.118	30.572	26	29.702	8	.870	54.8	67.5	53.9	60.283.7	2	38.4	26	53.8	82.2	53.2	1.420.46	30	26	SW.	
Nov.	30.096	30.032	30.063	30.064	30.425	28	29.456	28	1.066	41.1	52.4	45.3	46.471.3	2	36.1	25	43.2	53.0	44.0	3.891.44	2	27	SE.	
Dec.	30.176	30.117	30.150	30.147	30.027	27	29.491	7	1.136	33.8	41.0	37.5	37.466.2	31	8.0	20	57.6	44.4	31.0	8.011.47	6	28	NW.	
Sums	30.535	30.506	30.579	30.521	30.681	27	29.179	12	11.221	623.7	743.9	654.9	674.9	...	...	...	351.5708	598.2	445.98	...	...	...	...
Means	30.046	29.992	30.062	30.024	30.081	27	29.179	12	1.836	53.1	62.0	54.6	56.261.6	...	...	...	46.0	64.0	48.8	...	...	...	NW.

* January. † April. ‡ July.

BALTIMORE, MD.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Number of calms.	Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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												7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.										3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.02 a. m., 3.02 p. m., and 11.02 p. m., local time. Corrections for instrumental error of barometer used: From 7.02 a. m., January 1, to 11.02 p. m., September 4, inclusive, +.025 inch; from 7.02 a. m., September 5, to 11.02 p. m., December 31, inclusive, +.008 inch. Barometer 316 adopted as station instrument per instructions of August 9, 1884.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

REMARKS.—January, frequent rains and snows. February, unusually wet month; lunar halo 34; thunder-storm 14th. March, much cloudy weather and rain; thunder-storm 9th; last frost of the season 17th. April, lunar corona 28th. May, thunder-storms 9th, 13th, 19th, 23d, and 24th. June, thunder-storms 3d, 23d, and 25th. July, excessive rainfall; heavy frost and thunder-storm 11th; thunder-storm 24th, 25th, and 31st; rainbow 27th. August, lunar halo 1st; earthquake shock 10th; thunder-storms 4th, 21st, and 29th; rainbow 29th. September, severe drought during month; total rainfall .09 inch, smallest rainfall on record for any month (1871-1884). October, lunar halo 4th; solar halo 26th. November, heavy frost 7th (first of season); lunar corona 4th and 30th. December, lunar corona 6th.

GEO. W. FELGER,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BARNEGAT CITY, N. J.

Location of office on December 31, 1884, corner Central Avenue and Sixth street.

[Latitude, 39° 46' N.; longitude, 74° 6' W. Elevation of barometer above sea-level, 23 feet. Elevation of exposed thermometer above ground, 17 feet. Elevation of rain-gauge above ground, 39 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.							Precipitation.		Wind.		Total movement.					
	Washington time.					Self-registering thermometers.					Washington time.		Any secondary measurements.					Maximum hourly velocity during month.		Prevailing direction.							
	7 p. m.	8 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Date.			Minimum.	Delta.	Delta to range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.		Date.		Miles.	Direction.			
										7 a. m.	8 p. m.	11 p. m.													Monthly mean.		
1884.																											
Jan.	30.136	30.069	30.115	30.113	30.828	27	29.139	9	1.689	28.6	31.7	28.3	28.9	52.0	2	7.0	7	45.0	38.0	0	5.25	6.9	68	E	0	N	13.178
Feb.	30.043	30.030	30.062	30.052	30.716	16	29.145	28	1.571	37.1	40.8	38.5	37.8	53.8	0	13.0	29	43.8	46.4	0	1.11	19	28	52	30	N.W.	10.721
Mar.	30.018	29.956	30.011	29.995	30.454	16	29.470	28	1.984	34.3	42.3	38.5	38.0	63.0	0	11.8	1	51.7	45.8	0	2.58	19	20	48	30	N.W.	11.876
Apr.	29.845	29.793	29.842	29.827	30.176	14	29.097	2	1.084	45.4	50.3	45.0	44.9	81.2	0	24.2	7	29.8	63.8	0	1.79	23	2	48	10	N.W.	10.316
May	29.943	29.911	29.947	29.934	30.289	11	29.571	11	1.718	57.9	61.9	60.8	58.7	78.1	2	42.4	29	32.6	68.6	0	1.67	23	36	36	8	N.W.	10.071
June	30.072	30.055	30.057	30.061	30.491	15	29.744	9	1.747	65.8	69.1	63.7	60.8	82.8	0	48.1	18	34.7	72.8	0	2.24	20	36	56	29	N.W.	9.748
July	29.961	29.823	29.845	29.843	29.985	13	29.571	13	1.414	68.8	72.8	68.8	70.3	88.8	0	58.1	19	32.7	77.7	0	2.24	20	36	56	29	N.W.	9.804
Aug.	30.079	30.017	30.063	30.030	30.312	25	29.716	30	1.596	69.8	72.8	68.8	70.3	88.8	0	60.7	19	32.7	77.7	0	2.24	20	36	56	29	N.W.	9.898
Sept.	30.107	30.065	30.093	30.088	30.445	14	29.733	17	1.712	67.7	72.7	67.4	69.3	80.5	5	51.9	28	43.8	68.7	0	2.05	87	12	32	16	N.W.	10.871
Oct.	30.140	30.087	30.124	30.117	30.570	26	29.733	8	1.837	55.7	62.5	58.7	58.7	81.5	4	82.6	28	43.8	68.7	0	2.05	87	12	32	16	N.W.	10.871
Nov.	30.078	30.086	30.050	30.054	30.457	22	29.409	28	1.048	48.2	50.7	45.4	46.5	66.6	23	24.3	25	61.0	55.2	0	2.68	10	28	29	23	N.W.	9.970
Dec.	30.164	30.112	30.134	30.137	30.616	27	29.601	6	1.015	35.9	41.6	38.2	38.2	66.2	1	0.2	20	62.8	46.4	0	1.69	1.97	21	56	6	N	12.077
Sums	290.445	297.978	300.833	300.251	308.837	12	29.062	12	11.415	510.2	567.0	514.4	531.7	681.7		—	—	487.5	715.2		34.32	34.32	21	56	8	N	126.081
Means	30.087	30.098	30.028	30.021	30.828	12	29.062	12	1.951	50.8	55.9	51.2	52.0	68.8	1.74	—0.2	—20	40.8	58.9		34.32	34.32	21	56	8	N	126.081

* First 20 days only.

† Lowest exposed.

‡ 25 days.

§ January.

|| April.

¶ July.

** December.

HARBOR CITY, N. J.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Relative humidity (per cent).								Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Relative humidity (per cent).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
1894.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

* First 20 days only.

† Both minimum thermometers broken.

‡ For 25 days only.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.12 a. m., 3.12 p. m., and 11.12 p. m., local time.
 Correction for instrumental error of barometer used: From 7.12 a. m., January 1, to 11.12 p. m., December 31, 1894, inclusive, —.011 inch.
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.020; February, 0.020; March, 0.020; April, 0.020; May, 0.020; June, 0.020; July, 0.020; August, 0.020; September, 0.020; October, 0.020; November, 0.020; December, 0.020.

GERALD E. GRIFFIN,
First Lieut., Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BENNETT, FORT, DAK.

Location of office on December 31, 1884, room formerly adjutant's office.

[Latitude, 44° 43' N.; longitude, 100° 39' W. Elevation of barometer above sea-level, 1,510 (B) feet. Elevation of exposed thermometer above ground, 12 feet. Elevation of rain-gauge above ground, 18 feet.]

Barometer readings (corrected for temperature and instru- mental error only).										Temperature.						Precipitation.		Wind.		Total movement.								
Washington time.			Monthly mean.			Self-registering ther- mometers.			Washington time.	Any 3 con- secutive 8-hourly measure- ments.			Maximum hourly velocity during month.	Prevailing direction.														
7 p. m.	3 p. m.	11 p. m.	W.	H.	D.	Lowest.	Date.	Range.		7 p. m.	3 p. m.	11 p. m.			Monthly mean.	Maximum.	Date.	Minimum.	Date.		Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Direction.	Date.
1884.																												
Jan.	28.575	28.525	28.560	28.553	28.555	4	27.963	9	1.292	9	10.1	12.4	12	24.0	0	12	-31	4	80.0	24.8	-1.8	31.12	9	9	NW.	9	NW.	
Feb.	28.497	28.472	28.524	28.498	28.507	11	27.597	18	1.410	18	9.0	15.2	5	46.0	24	-32.5	9	82.7	17.2	-4.2	27.14	2	2	NW.	11	NW.		
Mar.	28.407	28.383	28.435	28.395	28.763	13	27.597	10	1.168	10	16.6	27.5	26	57.0	9	-19.0	7	81.6	39.4	17.0	1.08	60	28	NW.	28	NW.		
Apr.	28.410	28.386	28.411	28.404	28.396	20	27.839	29	1.127	29	16.1	41.5	42	57.4	0	24	19.0	7	84.0	64.7	31.9	2.385	68	28	NW.	28	NW.	
May	28.406	28.382	28.385	28.384	28.631	24	27.923	4	1.718	4	18.6	54.2	57	58.0	8	31.8	1	84.2	71.4	44.7	2.686	68	21	NW.	21	NW.		
June	28.359	28.323	28.334	28.339	28.531	1	27.948	11	1.635	11	23.5	70.4	72	66.0	3	43.5	2	85.6	85.6	58.7	3.70	57	15	NW.	15	NW.		
July	28.363	28.328	28.344	28.345	28.613	19	27.994	22	1.637	22	18.7	67.0	68	59.7	0	49.0	4	82.5	82.5	58.4	3.70	57	15	NW.	15	NW.		
Aug.	28.408	28.366	28.370	28.381	28.675	3	27.979	31	1.666	30	13.1	63.4	66	58.0	27	45.2	4	82.8	84.8	57.4	7.74	19	25	NW.	25	NW.		
Sept.	28.411	28.374	28.392	28.396	28.725	19	27.968	2	1.827	31	6.6	73.7	59.1	61.5	93.0	12	23.9	30	62.1	76.8	48.0	6.68	47	15	NW.	15	NW.	
Oct.	28.440	28.394	28.418	28.419	28.805	23	27.933	2	1.872	42	0	61.2	43.6	50.6	95.0	2	16.0	23	90.0	65.9	37.8	9.95	93	4	24	NW.	24	NW.
Nov.	28.531	28.486	28.520	28.512	28.868	5	27.968	26	1.879	20	8	44.5	30.8	31.7	99.8	6	-11.0	23	80.8	47.7	16.7	17.15	15	19	NW.	19	NW.	
Dec.	28.528	28.518	28.550	28.532	29.083	24	27.965	5	1.998	4	9	14.6	8.6	9.4	96.0	1	-41.3	25	94.3	19.3	-0.9	4.46	13	16	NW.	16	NW.	
Sums	341.249	340.815	341.113	341.068	340.815	11	27.965	11	227.412	462.2400	7	500.5	500.5	518.6	970	1	318.6	970	1	982.7	718.90	77	90	1	1	NW.	1	NW.
Means	28.497	28.491	28.498	28.491	28.265	4	27.967	10	1.666	34.4	51.7	41.3	42	59.8	0	-41.8	970	63.2	55.6	30.2	718.90	90	1	1	1	NW.	1	NW.

1 Self-register defective; for 10 days only. 2 Approximate. 3 Self-register defective; for 9 days only. 4 January. 5 March. 6 February. 7 August. 8 December.

BENNETT, FORT, D.A.K.—Continued.

Month.	Winds at 7 a. m., 9 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Mean.	7 a. m.	9 p. m.	11 p. m.	Mean.	7 a. m.	9 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 90°.	Thunder-storms.	Aurora.
1884.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Sums..	Percentages.				Percentages.													
5	8	12	4	18	5	5	5	5	13	7	8	7	50	1.5	1.5	1.2	1.2	4.4	2.3	24	7	12	46.7	6.6	9.0	0.5					

NOTE.—7 a. m., 9 p. m., and 11 p. m., Washington time, correspond to 5.35 a. m., 1.30 p. m., and 9.26 p. m., local time.

Correction for instrumental error of barometer used: From 5.36 a. m., January 1, 1884, to 9.26 p. m., December 31, 1884, inclusive, +.022.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.740; February, 1.730; March, 1.700; April, 1.540; May, 1.590; June, 1.540; July, 1.540; August, 1.540; September, 1.590; October, 1.620; November, 1.690; December, 1.760.

REMARKS.—April, navigation opened on 6th; May, frequent rains, thunder-storms; June, heavy rains, thunder-storms; July, continued heavy rains, hail-storms; August, very dry, high temperature; September, continued dry weather; October, first snow 20th, frequent frosts; December, remarkably low temperature, snow.

A. PRITCHARD,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BENTON, FORT, MONT.

Location of office on December 31, 1884, Grand Union Hotel.

[Latitude, 47° 50' N.; longitude, 110° 40' W. Elevation of barometer above sea-level, 2,681 (B) feet. Elevation of exposed thermometer above ground, 58 feet. Elevation of rain-gauge above ground, 49 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometer.					Total amount.		Any consecutive 8-hourly measure-ments.		Maximum hourly velocity during month.		Prevailing direction.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	7 p. m.			11 p. m.		Monthly mean.	Range.				7 a. m.			11 p. m.		Monthly mean.	Maximum.				Minimum.		Date.		Absolute range.		Mean maximum.			Mean minimum.		Total amount.	Largest amount.	Date.	Miles.	Direction from—	Data.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	7 p. m.	8 p. m.	11 p. m.	Lowest.	Date.		High-est.	Lowest.	Date.	Range.	7 a. m.	8 p. m.	11 p. m.	Maximum.	Date.		Minimum.	Date.	Minimum.	Date.	Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
1884.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

Eight days.

Twenty-four days.

One 7 a. m. two 3 p. m. one 11 p. m. observations missed.

Twenty-seven days.

Two 7 a. m. two 3 p. m. two 11 p. m. observations missed.

Four 7 a. m. four 3 p. m. four 11 p. m. observations missed.

Three 7 a. m. three 3 p. m. three 11 p. m. observations missed.

Thirty-one days.

February.

March.

December.

BENTON, FORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent).	Cloudiness (in tenths).					Number of days—																			
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.																											
	Number of calms.										Washington time.																								
	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.			7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 30°.	Thunder-storms.	Aurora.												
1884.																																			
Jan.....	3	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0													
Feb.....	4	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0													
Mar.....	4	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0													
Apr.....	3	21	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0													
May.....	6	12	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4													
June.....	3	15	10	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1													
July.....	3	18	13	7	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4													
Aug.....	0	27	8	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2													
Sept.....	2	16	7	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1													
Oct.....	3	18	8	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2													
Nov.....	3	13	5	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1													
Dec.....	3	13	5	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1													
Sums ..	33	178	64	30	36	288	130	67	253	283.9	384.9	343.6	338.1	372.8	642.2	783.5	704.7	61.1	57.6	53.8	57.2	123	146	86	90	172	16	18	3					
Means ..	Percentages.														Percentages.							Percentages.													

Eight days. *Two 7 a. m., two 3 p. m., one 11 p. m. observations missed. *Three 7 a. m., three 3 p. m., three 11 p. m. observations missed.
 †One 7 a. m., two 3 p. m., one 11 p. m. observations missed. †Four 7 a. m., four 3 p. m., four 11 p. m. observations missed.
 ‡Twenty-seven days. ‡Thirty-one days. *Three hundred and fifty-six days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.46 a. m., 12.46 p. m., and 3.46 p. m., local time.

Correction for instrumental error of barometer used: +.029 for entire year.

The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 2.97; February, 2.89; March, 2.97; April, 2.85; May, 2.78; June, 2.76; July, 2.70; August, 2.83; September, 2.89; October, 2.90; November, 2.95; December, 2.99.

REMARKS.—February 24, the ice in the river broke; on 25th an immense gorge formed, flooding entire town. July 15, a hail-storm. September 7, first frost of season. October 2, first snow of season. December noted for its remarkable cold and calm.

B. O. LENOIR,
 Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BISMARCK, DAK.

Location of office on December 31, 1884, corner Main and Third streets.

[Latitude, 48° 47' N.; longitude, 100° 39' W. Elevation of barometer above sea-level, 1,694 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 31 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.					
	Washington time.					Washington time.					Self-registering thermometers.					Any 2 consecutive 8-hourly measurements.					Maximum hourly velocity during month.				Prevailing direction.					
	7 P. M.	3 P. M.	11 P. M.	Monthly mean.	Range.	Date.	Lowest.	Highest.	Date.	Range.	7 P. M.	3 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Large amount.	Date.	Miles.	Direction from—	Date.	Miles.	Direction from—	Total movement.	
1884.																														
Jan.	28.296	28.237	28.282	28.276	28.047	4	27.633	12	1.294	12	8.3	8.2	8.2	4.242	0	12	-40.0	4	82.0	14.5	7.6	.38	12	23	32	NW.	11	NW.	5.441	
Feb.	28.229	28.221	28.263	28.238	28.002	11	27.417	18	1.385	18	8.1	8.1	8.1	-1.15	0	24	-23.0	11	73.0	8.9	9.8	.87	11	45	40	NW.	18	NW.	5.393	
Mar.	28.158	28.145	28.151	28.151	28.088	13	27.421	10	1.067	10	26.2	26.2	19.7	19.758	5	26	-14.4	6	28.9	10.5	10.5	.19	13	24	30	NW.	11	NW.	5.269	
Apr.	28.190	28.178	28.179	28.182	28.390	20	27.508	29	1.243	29	48.4	48.4	33.1	33.738	5	24	17.0	7	52.8	47.6	40.1	.20	20	26	30	N.	30	N.	5.261	
May	28.183	28.153	28.156	28.165	28.390	29	27.768	4	1.012	4	65.1	65.1	54.6	53.480	1	16	29.1	1	67.1	44.1	54.8	.53	23	28	30	N.	28	N.	5.181	
June	28.138	28.114	28.109	28.128	28.370	1	27.828	27	1.543	27	73.0	67.8	67.8	66.492	0	28	43.7	1	81.2	54.8	63.0	.95	28	28	30	NE	8	NE	5.804	
July	28.149	28.125	28.125	28.135	28.381	19	27.873	31	1.508	31	57.4	63.5	63.5	64.383	9	7	32.0	6	74.6	52.6	63.0	.25	16	32	30	NW.	8	R.	4.914	
Aug.	28.164	28.145	28.147	28.152	28.432	4	27.708	1	1.689	1	56.9	75.7	64.5	65.791	4	15	45.2	7	77.9	55.0	83.0	.63	15	30	15	S.	15	S.	5.858	
Sept.	28.074	28.055	28.088	28.072	28.497	19	27.631	23	1.859	23	49.9	64.9	54.0	55.981	5	13	32.0	45.5	66.6	48	2.34	.71	9	10	35	NW.	8	NW.	6.187	
Oct.	28.123	28.143	28.170	28.163	28.586	20	27.728	10	1.841	10	54.5	44.9	44.9	44.580	0	18	10.5	70.1	58.9	35.7	.92	21	35	21	NW.	21	NW.	7.037		
Nov.	28.255	28.232	28.233	28.233	28.697	6	27.718	26	1.919	26	37.2	37.2	27.1	28.042	4	6	-5.528	73.8	41.5	18.9	.73	16	32	16	NW.	16	NW.	4.837		
Dec.	28.253	28.266	28.254	28.266	28.732	24	27.727	5	1.065	5	2.3	2.3	2.5	28.040	3	5	-35.423	81.2	12.4	42	1.71	19	32	19	NW.	19	NW.	4.947		
Years.	28.207	28.098	28.222	28.181	28.047	...	28.379	...	16.811	279.0	54.5	43.9	43.9	43.9	43.9	...	758.855	328.023	36	...	...	...	...	...	...	...	...	...	65.128
Months.	28.156	28.174	28.156	28.159	28.047	...	27.417	...	1.066	...	28.6	28.6	28.6	27.832	...	128	-40.0	...	68.1	27.3	...	...	...	...	...	...	...	...	...

January.

February.

January.

February.

* January.

† February.

‡ June.

HIMABOK, DAK.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number at times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.				Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.				
									7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.										7 a. m.	8 p. m.	11 p. m.	Mean.
1884.																													
Jan.....	11	7	10	4	4	3	10	24	10-2.3	3.9	0.0	0.5	39.6	80.1	87.4	85.7	5.2	4.4	8	4.8	31	0	0	0	0				
Feb.....	20	9	6	5	1	1	6	28	17-5.9	14.0	-3.5	14.1	91.5	80.1	90.2	87.8	6.2	4.6	8	5.8	29	0	0	0	0				
Mar.....	18	12	13	10	5	1	4	21	8.8	18.5	14.9	14.1	83.0	73.5	81.1	78.5	4.3	4.3	10	4.1	27	0	0	0	0				
Apr.....	25	12	13	10	5	1	1	7	27.8	30.9	31.0	29.0	83.0	66.5	76.3	73.8	6.2	5.9	10	15	10	0	0	0	0				
May.....	19	12	4	16	24	0	0	11	40.6	43.1	44.1	42.6	80.5	47.3	69.0	65.6	8.1	4.2	12	6	10	0	0	0	0				
June.....	11	13	12	15	24	0	0	14	53.2	59.0	60.0	59.4	87.6	53.1	78.2	73.0	4.9	3.4	7	0	0	0	0	0	0				
July.....	11	8	19	8	7	0	2	14	58.8	55.7	53.2	55.9	88.4	58.1	83.2	76.6	4.9	5.6	4	0	0	0	0	0	0				
Aug.....	10	8	9	8	21	0	4	11	52.8	57.4	55.5	55.8	86.6	53.8	74.2	72.2	3.5	4.1	12	0	0	0	0	0	0				
Sept.....	8	14	4	6	6	0	1	21	45.0	50.5	47.9	47.8	87.1	61.9	80.5	76.5	4.5	3.0	15	0	0	0	0	0	0				
Oct.....	11	8	9	10	13	0	2	26	33.1	35.8	33.7	34.9	79.3	59.5	71.6	67.1	3.5	3.0	14	18	4	1	1	1	0				
Nov.....	16	4	5	8	6	0	2	21	18.6	27.4	22.6	22.3	87.7	70.8	83.0	80.7	1.6	1.6	18	7	28	0	0	0	0				
Dec.....	10	2	0	0	0	0	7	33	.04	2.8	.04	1.0	86.5	73.8	83.5	83.8	4.7	3.0	15	24	30	0	0	0	0				
Sums..	165	82	112	119	104	28	51	241	100	331.5	385.3	368.0	361.1	1029.7	770.1	900.2	920.1	54.0	56.6	137	159	70	128	97	176	4	18	7	
Percentages.																													
Means.	15.0	7.5	10.2	10.8	9.5	2.6	4.9	21.9	27.6	32.1	30.5	30.1	85.8	64.2	80.0	76.7	4.5	4.7	8.6	4.3	37.4	42.4	10.1	34.4	36.5	48.1	1.1	14.9	1.9

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.26 a. m., 1.26 p. m., and 9.26 p. m. local time.
 Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.003 inch.
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.00; February, 1.98; March, 1.92; April, 1.88; May, 1.79; June, 1.76; July, 1.73; August, 1.76; September, 1.80; October, 1.88; November, 1.93; December, 2.02.
 REMARKS.—Meteorologic shower May 23.

C. S. BENNETT
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BLOCK ISLAND, R. I.

Location of office on December 31, 1884, corner of Main and Beach streets.

[Latitude, 41° 10' N.; longitude, 71° 30' W. Elevation of barometer above sea-level, 27 feet. Elevation of exposed thermometer above ground, 8 feet. Elevation of rain-gauge above ground, 25 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.					Monthly mean.					Highest.					Lowest.					Self-registering thermometers.						Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	7 P. M.		11 P. M.			Monthly mean.	Date.	In.	Range.	7 A. M.	8 P. M.	11 P. M.	Washington time.				Date.				Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.		Miles.	Direction.	From—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	In.	Ft.	In.	Ft.	In.								Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.											Ft.		In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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§ December.

§ September.

§ February.

§ January.

BLOOM ISLAND, E. I.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.			Relative humidity (per cent.).			Clearness (in tenths).			Number of days—									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which, 0.1 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.	
1884.																											
Jan.....	24	11	1	1	1	1	1	1	22.7	25.3	24.6	21.2	81.5	78.1	80.9	80.3	5.1	6.2	3.3	14	11	25	0	0	0	0	
Feb.....	14	16	1	1	1	1	1	1	30.8	32.3	30.2	28.1	84.1	84.0	83.8	84.3	6.8	4.7	3.3	17	20	15	0	0	0	0	
Mar.....	22	22	3	3	3	3	3	3	28.3	31.9	30.1	28.1	81.1	79.3	81.1	79.7	5.5	5.8	3.3	11	15	15	0	0	0	0	
Apr.....	7	13	2	2	2	2	2	2	47.8	49.7	48.1	48.1	87.7	79.3	84.8	84.5	3.9	4.7	3.3	13	9	0	0	0	0	0	
May.....	5	16	2	2	2	2	2	2	54.8	53.6	55.9	57.1	86.6	79.3	87.4	84.6	4.4	3.5	3.3	9	0	0	0	0	0	0	
June.....	4	9	4	4	4	4	4	4	60.0	62.4	60.7	61.0	84.6	79.3	87.4	84.6	4.4	4.7	3.3	17	0	0	0	0	0	0	
July.....	4	9	4	4	4	4	4	4	63.2	65.3	63.4	63.4	84.6	79.3	87.4	84.6	4.4	4.6	3.3	14	0	0	0	0	0	0	
Aug.....	8	17	2	2	2	2	2	2	58.3	61.4	59.4	59.4	83.8	79.3	87.4	84.6	3.9	3.8	3.3	7	0	0	0	0	0	0	
Sept.....	13	8	5	5	5	5	5	5	47.4	48.7	47.3	47.3	81.6	79.3	87.4	84.6	3.9	3.8	3.3	11	0	0	0	0	0	0	
Oct.....	19	12	7	7	7	7	7	7	34.0	38.2	34.3	34.3	81.6	79.3	87.4	84.6	3.9	3.8	3.3	10	13	8	11	0	0	0	
Nov.....	13	10	7	7	7	7	7	7	31.4	33.2	33.2	33.2	83.9	83.9	84.9	84.4	7.3	5.9	4.6	13	13	12	0	0	0	0	
Dec.....	16	20	8	8	8	8	8	8	31.4	33.2	33.2	33.2	83.9	83.9	84.9	84.4	7.3	5.9	4.6	13	13	12	0	0	0	0	
Sums ..	154	179	83	78	71	803	90	157	531.8	548.1	533.0	532.9	9102.3	943.9	1021.7	907.6	53.5	61.5	52.3	158	20	77	0	12	3	8	
Means .	14.91	17.2	8.3	7.1	6.57	9.71	2.3	2.3	43.5	45.7	44.1	44.4	85.2	79.1	85.1	83.1	4.9	5.1	4.4	4.8	34.3	41.5	34.3	0.0	0.0	0.0	0.0
Percentages.															Percentages.												

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.22 a. m., 3.22 p. m., and 11.22 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.015 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .030; February, .030; March, .030; April, .030; May, .030; June, .030; July, .030; August, .030; September, .030; October, .030; November, .030; December, .030.

REMARKS.—January 7 and 10, lunar halo; January 23, solar halo; February 3, light frost, solar halo, polar bands; February 10, lunar corona; February 22, heavy frost; February 23, heavy rain and thunder-storm; March 1, aurora; March 18, polar bands; March 22, light frost; March 23, lightning; April 2, 16, 17, thunder-storms; April 26, meteor; April 28, light frost; May 5, 9, 20, thunder-storms; June 14, solar halo; June 19, 26, thunder-storms; July 6, 12, 13, 19, thunder-storms; August 15, mirage; August 22, thunder-storm; September 13, aurora; November 4, aurora, meteor; November 10, 16, 22, light frost; December 23, lunar halo; December 25, lunar corona.

J. N. O. T. EIKER, Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BOISE CITY, IDAHO.

Location of office on December 31, 1884, Davis building.

[Latitude, 43° 27' N.; longitude, 110° 8' W. Elevation of barometer above sea-level, 2,760 B feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 32 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.			Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometer.						Total amount.	Any 2 consecutive 8-hourly measurements.			Maximum hourly velocity during month.			Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	7 P.	9 P.	11 P.						7 P.	9 P.	11 P.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.		Mean minimum.	Largest amount.	Date.	Miles.	Direction.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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§ August.

‡ June.

† February.

• January.

BOISE CITY, IDAHO—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—								Dew-point.			Relative humidity (per cent.).		Clearness (in tenths).				Number of days—													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.	
1884.																															
Jan.....	8	0	4	14	6	15	28	18	14.4	27.8	26.4	23.9	83.7	75.1	70.5	81.1	82.5	62.4	4.4	15	6	10	7	2	20	0	0	0	0	0	0
Feb.....	10	1	2	18	13	11	5	20	21.4	26.9	24.1	24.6	86.6	71.9	69.4	79.4	75.5	62.4	4.3	10	8	11	11	3	19	0	0	0	0	0	0
Mar.....	7	0	3	27	8	6	6	24	32.0	33.2	24.9	33.4	79.9	67.2	60.7	69.4	62.3	62.4	4.2	17	12	11	19	0	0	0	0	0	0	0	0
Apr.....	7	0	10	17	6	6	6	24	43.9	42.8	40.4	43.6	71.7	64.2	60.7	68.4	62.3	62.4	4.2	10	13	5	9	0	0	0	0	0	0	0	0
May.....	2	6	11	11	11	5	9	34	43.0	52.8	50.7	48.8	72.7	56.1	65.5	65.4	4.6	4.6	3.1	2.6	16	13	2	11	0	0	0	0	0	0	0
June.....	4	7	12	11	6	2	8	27	43.2	54.8	54.6	53.3	72.5	63.2	61.2	61.6	4.5	4.5	2.4	1.3	1.9	13	7	1	3	0	0	0	0	0	0
July.....	7	0	8	14	7	4	14	22	49.0	54.8	53.7	52.5	76.4	69.2	66.1	69.3	2.1	1.1	1.7	1.5	2.0	20	6	0	0	0	0	0	0	0	0
Aug.....	7	0	8	12	4	1	24	22	40.5	41.6	42.1	41.4	73.5	60.9	63.5	64.3	4.1	4.6	3.6	4.1	3.8	13	10	7	7	0	0	0	0	0	0
Sept.....	8	2	10	24	6	4	18	19	35.9	35.2	33.1	36.4	76.2	43.2	61.2	60.2	4.2	2.7	2.6	13	14	4	4	5	0	0	0	0	0	0	0
Oct.....	9	3	8	12	4	1	21	20	30.7	32.1	33.4	32.7	88.0	63.8	73.1	74.0	2.8	6.2	3.0	16	12	2	1	7	0	0	0	0	0	0	0
Nov.....	2	3	8	29	4	1	21	20	20.7	28.2	24.1	22.7	83.6	69.3	83.6	80.3	5.8	2.2	2.0	9	9	7	15	17	0	0	0	0	0	0	0
Dec.....	69	54	90	214	76	54	175	272	430.7	477.6	477.8	453.7	833.4	693.8	803.4	803.4	47.4	82.6	44.2	168	123	75	108	17	90	17	15	0	0	0	0
Sums..	Percentages.								Percentages.								Percentages.								Percentages.						
Means..	6.3	4.9	8.7	19.5	6.9	4.9	14.9	9.3	4.9	5.7	5.7	5.7	73.2	55.7	67.4	67.1	4.0	4.4	3.7	45.9	33.6	30.5	29.5	4.6	37.0	4.6	4.1	0	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.24 a. m., 12.24 p. m., and 8.24 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive, +.014 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.930; February, 2.960; March, 2.920; April, 2.840; May, 2.840; June, 2.780; July, 2.720; August, 2.760; September, 2.770; October, 2.890; November, 2.940; December, 2.980.

REMARKS.—February, one foggy day; March 26, last snow-fall; May 4, last frost; May 11, flood of Boise River carried away section of bridge; June, thunder-storms and lightning very frequent and precipitation excessive; July 28, zodiacal light in evening; September 3, first frost (light); September 25, first killing frost and ice; October 13, unusually severe electrical disturbance, with sleet and heavy rain; December 15-17, very heavy snow-storm; monthly precipitation excessive.

JAMES KENEALY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BOSTON, MASS.

Location of office on December 31, 1884, post-office and sub-treasury building.

[Latitude, 42° 21' N.; longitude, 71° 4' W. Elevation of barometer above sea-level, 122 feet. Elevation of exposed thermometer above ground, 116 feet. Elevation of rain-gauge above ground, 174 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Range.	Washington time.				Self-registering thermometer.				Total amount.	Any 3 consecutive 3-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	7 P. M.	3 P. M.	11 P. M.					7 A. M.	8 P. M.	11 P. M.	Monthly mean.	Maximum.	Minimum.	Date.	Abnormal range.			Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

BOSTON, MASS.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
										7 a. m.	8 p. m.	11 p. m.	Mean.										7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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Jan.....	9	6	1	2	3	21	23	31	0	12.9	18.8	17.2	16.1	72.5	70.2	76.1	72.3	8	11	12	13	14	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* 80 days only.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 7.24 a. m., 7.24 p. m., and 11.24 p. m., local time.

Correction for instrumental error of barometer used: From January 1 to December 31, 1884, inclusive, +.010 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.140; February, 0.140; March, 0.140; April, 0.140; May, 0.140; June, 0.139; July, 0.139; August, 0.139; September, 0.140; October, 0.139; November, 0.139; December, 0.139.

REMARKS.—The elevation of instruments was changed as follows on October 1, 1884: Old elevation: Barometer, 142.19 feet; exposed thermometer, 155.41 feet; wet bulb thermometer, 155.58 feet; maximum thermometer, 155.83 feet; minimum thermometer, 166.02 feet; rain-gauge, 161.50 feet; anemometer, 177.67; New elevation: Barometer, 124.88 feet; exposed thermometer, 116.29 feet; wet bulb thermometer, 131.00 feet; anemometer, 180.83 feet.

OTTO B. COLE
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BROWNSVILLE, TEX.

Location of office on December 31, 1884, corner Elizabeth and Fourteenth streets.

[Latitude, 25° 58' N.; longitude, 97° 20' W. Elevation of barometer above sea-level, 57 feet. Elevation of exposed thermometer above ground, 17 feet. Elevation of rain-gauge above ground, 34 feet.]

Barometer readings (corrected for temperature and instrumental error only).												Temperature.						Precipitation.			Wind.		Total movement.
Washington time.				Monthly mean.	Washington time.				Self-registering ther- mometers.				Mean maximum.	Mean minimum.	Any 8 con- secutive hourly measure- ments.		Maximum hourly velocity during month.	Prevailing direction.					
7 A. M.	3 P. M.	11 P. M.	Range.		7 A. M.	3 P. M.	11 P. M.	Monthly mean.	Date.	Maximum.	Date.	Minimum.			Date.	Absolute range.			Total amount.	Largest amount.	Date.	Miles.		Direction from—	Date.
1884.																					Miles.		
Jan.	30.183	30.159	30.203	30.182	30.645	30.369	30.159	30.159	30.159	30.159	30.159	30.159	30.159	30.159	30.159	30.159	30.159	30.159	30.159	30.159	6,963		
Feb.	30.978	30.976	30.015	30.087	30.664	30.064	30.064	30.064	30.064	30.064	30.064	30.064	30.064	30.064	30.064	30.064	30.064	30.064	30.064	30.064	8,464		
Mar.	29.906	29.878	29.917	29.900	30.235	30.026	30.026	30.026	30.026	30.026	30.026	30.026	30.026	30.026	30.026	30.026	30.026	30.026	30.026	30.026	8,106		
Apr.	29.850	29.830	29.868	29.849	30.156	30.118	30.118	30.118	30.118	30.118	30.118	30.118	30.118	30.118	30.118	30.118	30.118	30.118	30.118	30.118	8,201		
May.	29.860	29.845	29.881	29.872	30.123	30.089	30.089	30.089	30.089	30.089	30.089	30.089	30.089	30.089	30.089	30.089	30.089	30.089	30.089	30.089	8,208		
June.	29.870	29.869	29.881	29.875	30.098	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	4,489		
July.	29.900	29.884	29.903	29.898	30.088	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	30.078	7,807		
Aug.	29.922	29.902	29.928	29.917	30.031	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	30.029	8,208		
Sept.	29.878	29.854	29.893	29.875	30.045	30.048	30.048	30.048	30.048	30.048	30.048	30.048	30.048	30.048	30.048	30.048	30.048	30.048	30.048	30.048	8,208		
Oct.	29.908	29.950	29.991	29.971	30.148	30.106	30.106	30.106	30.106	30.106	30.106	30.106	30.106	30.106	30.106	30.106	30.106	30.106	30.106	30.106	8,208		
Nov.	30.938	30.925	30.980	30.953	30.072	30.069	30.069	30.069	30.069	30.069	30.069	30.069	30.069	30.069	30.069	30.069	30.069	30.069	30.069	30.069	8,208		
Dec.	30.943	30.935	30.974	30.951	30.075	30.073	30.073	30.073	30.073	30.073	30.073	30.073	30.073	30.073	30.073	30.073	30.073	30.073	30.073	30.073	8,208		
Sums.	352,210	352,101	372,524	359,318																	74,175		
Means.	29.945	29.925	29.961	29.945	30.045	30.011	30.011	30.011	30.011	30.011	30.011	30.011	30.011	30.011	30.011	30.011	30.011	30.011	30.011	30.011	30.011		

September.

April.

January.

BROWNSVILLE, TEX.—Continued.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.38 a. m., 1.38 p. m., and 9.38 p. m., local time. Correction for instrumental error of barometer used: From 5.38 a. m., January 1, to 9.38 p. m., December 31, 1884, inclusive, +.002 inob. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .000; February, .000; May, .000; June, .000; July, .000; August, .000; September, .000; October, .000; November, .000; December, .000.

JNO. MCGLONE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

BUFFALO, N. Y.

Location of office on December 31, 1884, Board of Trade building.

[Latitude, 43° 53' N.; longitude, 78° 53' W. Elevation of barometer above sea-level, 690 feet. Elevation of exposed thermometer above ground, 161 feet. Elevation of rain-gauge above ground, 108 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.									
Month.	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.	Total movement.			
	7 p. m.	3 p. m.	11 p. m.							Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.					Direction from—	Miles.	Date.			Amount.	Direction.	
1884.																											
Jan.	28.337	28.295	28.317	28.316	27	23.574	28.574	21	1.477	15.7	19.6	17.7	18.0	45.7	30	13.5	25	25.2	10.9	2.36	75	W.	59	W.	12.224		
Feb.	28.298	28.294	28.270	28.267	15	28.554	28.554	19	1.289	25.2	28.1	25.6	26.8	55.0	19	7.4	23	32.4	36.3	18.4	4.03	53	27	SW.	8.381		
Mar.	28.263	28.246	28.260	28.257	23	28.632	28.710	26	9.223	27.1	32.2	32.7	30.8	60.9	25	2.0	21	62.9	30.8	22.4	1.05	11	12	SW.	8.009		
Apr.	28.187	28.134	28.161	28.154	23	28.624	28.653	21	1.161	36.3	43.9	38.9	39.7	76.9	27	24.2	6	45.6	47.9	32.7	1.56	51	16	SW.	7.144		
May	28.181	28.166	28.177	28.175	8	28.833	28.833	8	2.652	50.1	53.0	51.2	52.1	76.9	23	24.2	6	45.6	47.9	32.7	1.56	51	16	SW.	7.477		
June	28.351	28.318	28.322	28.320	15	28.957	28.957	15	2.754	62.6	72.2	64.1	66.5	83.5	22	47.9	15	37.2	75.4	58.0	2.90	149	11	22	NE.	5.084	
July	28.145	28.118	28.127	28.130	28.711	28.815	28.815	31	4.096	63.6	68.0	64.2	64.9	83.5	8	50.9	11	33.5	71.8	68.3	5.11	149	10	11	NE.	5.084	
Aug.	28.298	28.270	28.253	28.254	28.590	28.901	28.901	26	2.729	63.8	73.1	65.7	67.5	87.9	16	40.8	23	41.5	73.8	68.3	4.56	236	28	28	SW.	8.189	
Sept.	28.345	28.308	28.325	28.327	28.787	28.916	28.916	28	1.611	62.6	70.5	63.5	65.6	88.1	19	40.9	13	48.1	72.6	58.4	1.77	84	24	28	SW.	7.053	
Oct.	28.394	28.359	28.380	28.371	28.787	28.916	28.916	28	1.841	49.4	55.1	51.5	52.0	72.5	4	24.7	26	47.8	59.3	44.7	1.54	34	25	42	SW.	8.993	
Nov.	28.394	28.257	28.296	28.292	28.668	28.916	28.916	23	1.002	36.0	41.1	38.6	37.9	61.9	10	10.6	24	60.4	35.4	31.6	2.01	69	23	60	W.	9.975	
Dec.	28.340	28.317	28.343	28.333	28.920	28.920	28.920	26	1.372	38.9	31.3	28.1	29.8	67.9	30	3.5	19	51.4	35.7	24.0	8.07	63	6	7	SW.	10.865	
Means	28.287	28.281	28.301	28.298	28.001	28.920	28.920	28	1.567	52.2	0.00	53.7	54.6	68.1	110	13.5	25	59.1	64.2	4.404	537.07	SW.	96.573
Means	28.283	28.254	28.270	28.269	28.001	28.920	28.920	28	1.564	48.5	49.2	44.8	45.6	68.1	110	13.5	25	49.3	53.5	38.7	SW.	...

September.

April.

January.

BUFFALO, N. Y.—Continued.

Month.	Wind at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—									
															Washington time.					Percentages.									
North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.	
1884.																													
Jan.....	8	8	3	4	10	36	22	2	0	13.6	15.3	0	87.1	83.2	82.3	84.2	8.8	8.5	8.2	8.5	1	7	23	20	21	31	0	0	0
Feb.....	3	21	4	10	7	17	21	11	0	21.5	22.6	0	85.8	80.5	85.6	84.0	9.2	8.6	8.5	7.3	0	0	20	22	7	25	0	0	0
Mar.....	8	17	5	4	10	27	11	11	0	21.5	24.8	0	80.0	74.7	81.9	78.9	5.7	5.5	5.5	3.8	0	9	8	16	11	27	0	0	0
Apr.....	6	18	8	3	7	25	12	9	0	31.2	32.8	0	82.6	82.1	78.9	76.7	6.4	6.2	4.5	5.7	8	10	12	10	0	14	0	0	0
May.....	4	7	12	4	14	32	14	4	2	42.5	44.6	0	76.3	70.1	78.6	75.0	5.4	4.0	6.7	4.0	18	9	10	16	0	0	0	0	0
June.....	0	18	11	5	15	33	17	1	0	55.4	55.0	0	76.3	58.0	77.4	75.0	3.3	2.4	1.9	2.9	17	11	8	10	0	0	0	0	0
July.....	4	2	4	3	10	41	17	6	0	56.3	57.2	0	80.3	70.8	78.7	76.6	5.5	5.5	3.4	5.6	16	17	8	13	0	0	0	0	0
Aug.....	4	5	10	5	25	37	9	6	2	58.9	58.3	0	79.2	61.5	74.6	71.8	3.9	3.7	3.0	3.5	12	11	4	9	0	0	0	0	0
Sept.....	6	6	8	3	21	27	12	6	1	43.2	47.4	0	87.7	76.0	84.6	83.4	4.1	3.8	4.1	4.0	13	13	6	10	0	0	0	0	0
Oct.....	8	3	9	2	17	24	23	6	1	45.2	47.4	0	85.6	76.3	84.0	82.0	5.6	6.7	4.7	5.7	7	14	10	17	0	4	0	0	0
Nov.....	5	5	4	4	15	22	29	5	0	32.3	34.9	0	84.3	78.6	83.7	82.9	8.0	7.6	8.0	7.3	5	7	16	13	2	13	0	0	0
Dec.....	2	8	14	11	15	22	20	1	0	23.6	27.0	0	87.4	84.1	87.6	86.4	8.8	7.8	8.2	8.3	1	8	22	18	10	22	0	0	0
Sums..	58	118	93	58	166	333	197	61	14	460.7	482.7	470.6	983.9	881.9	980.9	982.4	74.7	75.7	63.2	71.3	81	144	141	174	51	186	0	15	1
Means.	5.3	10.7	8.5	5.3	15.1	30.3	17.9	5.6	1.3	38.4	40.2	30.2	82.8	73.5	81.7	78.3	6.2	6.3	5.8	5.9	22.1	38.3	38.5	47.5	13.9	37.2	0	4.1	0.3
Percentages.																													

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.53 a. m., 2.53 p. m., and 10.53 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., January 1, 1884, to 11 p. m., February 24, 1884, inclusive, +.007 inch; from 3 a. m., February 25, 1884, to 11 a. m., September 10, 1884, inclusive, +.007 inch; from 3 p. m., September 10, 1884, to 11 p. m., December 31, 1884, inclusive, +.007 inch (approved U. S. O., September 17, 1884).

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .790; February, .790; March, .780; April, .770; May, .740; June, .720; July, .720; August, .720; September, .720; October, .750; November, .770; December, .790.

REMARKS.—Last frost of season, March 28; first frost of season, September 19; aurora, March 28, from 8.10 p. m. to 10 p. m.

D. CUTHBERTSON,
Sergeant, Signal Corps, U. S. A.

BUDFORD, FORT. DAK.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.	Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.		Washington time.				On which .01 inch or more precipitation fell.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Anorms.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
											7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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* Four 7 a. m., five 3 p. m., and five 11 p. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 8, 12 a. m., and 9, 12 p. m., local time.

Correction for instrumental error of barometer used: From 3.12 a. m., January 1, to 3.12 p. m., December 31, 1884, inclusive, +.021 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.280; February, 2.210; March, 2.160; April, 2.100; May, 2.060; June, 1.990; July, 1.960; August, 1.950; September, 2.020; October, 2.100; November, 2.160; December, 2.270.

REMARKS.—January, aurora 25th; snow from a cloudless sky 28th. March, aurora 16th, 20th, 21st, 28th. April, frost 1st, 2d, 3d, 8th, 17th, 19th, 20th. May, frost 1st, 2d, 5th. June, aurora 18th, 18th. September, first frost (light) 9th, 18th, and killing frost 30th; aurora 17th and 18th. October, aurora 9th and 16th; frost 4th, 7th, and 27th.

November, frost 3d, 4th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th. December, frost 3d, 4th, 5th, 17th.

A. S. CHNEIDEK,
Corporal, Signal Corps, U. S. A.

Met-orological summary for the year ending December 31, 1884—Continued.

CAIRO, ILL.

Location of office on December 31, 1884, United States custom-house.

[Latitude, 37° N.; longitude, 88° 10' W. Elevation of barometer above sea-level, 377 feet. Elevation of exposed thermometer above ground, 44 feet. Elevation of rain-gauge above ground, 18 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.		Wind.		Total movement.											
Washington time.		Monthly mean.		Highest.		Lowest.		Range.		Washington time.			Self-registering thermometers.		Mean maximum.		Mean minimum.			Any 3 consecutive hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.						
7 a.m.	3 p.m.	11 p.m.	In.	In.	Date.	In.	In.	Date.	In.	7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.		Total amount.	Largest amount.	Date.	Miles.		Direction from —	Date.				
1884.																														
Jan.	29.888	29.847	29.889	29.875	30.358	5	29.850	31	1.008	24.0	32.1	27.6	27.9	63.5	30	—16.0	5	31.5	35.4	19.2	2.32	56	7.8	88	W.	19	S.	7.119		
Feb.	29.709	29.661	29.690	29.690	30.098	15	29.105	19	.901	39.2	45.0	41.7	42.0	69.0	4	12.0	14	57.0	49.5	33.8	1.89	9	6	42	N.W.	19	S.	6.946		
Mar.	29.672	29.635	29.650	29.649	30.042	3	29.131	1	.911	42.9	52.0	48.0	47.6	71.0	28	19.0	3	52.0	54.5	41.0	4.20	1	0	42	W.	25	S.	7.583		
Apr.	29.581	29.537	29.555	29.564	29.800	11	29.030	14	.779	51.7	60.5	56.3	56.2	80.0	30	37.7	10	42.3	63.6	43.9	3.65	1	28	48	N.W.	10	N.W.	7.193		
May	29.612	29.567	29.598	29.599	29.874	30	29.322	18	.552	61.0	72.7	65.4	66.4	82.5	10	49.0	2	33.5	74.1	59.0	4.57	1	28	34	N.W.	21	N.W.	6.531		
June	29.632	29.602	29.608	29.614	29.818	17	29.322	9	.496	70.0	78.7	72.4	73.7	92.0	23	56.0	10	36.0	80.9	67.4	2.95	1	28	34	S.W.	9	S.	4.444		
July	29.591	29.562	29.565	29.573	29.779	21	29.375	9	.404	74.1	84.1	78.5	78.2	92.0	3	66.6	14	25.4	85.6	70.6	7.34	2	16	5	N.E.	26	S.	4.255		
Aug.	29.703	29.670	29.681	29.685	29.873	9	29.398	29	.475	69.7	82.8	73.6	75.4	90.0	28	57.0	10	33.0	83.6	67.4	2.74	1	22	27	N.W.	29	N.	4.112		
Sept.	29.699	29.670	29.684	29.684	29.875	20	29.427	23	.448	68.4	81.4	72.7	74.2	91.0	8	57.4	18	33.6	82.0	66.8	5.02	2	20	29	N.W.	17	S.	4.363		
Oct.	29.797	29.763	29.772	29.777	30.095	23	29.553	26	.542	57.3	71.0	61.7	63.3	88.0	2	38.0	24	50.0	72.3	55.5	1.89	1	07	26	N.W.	29	S.	4.305		
Nov.	29.771	29.740	29.750	29.754	30.200	6	29.231	22	.660	42.5	55.3	47.7	48.5	60.5	3	22.2	24	47.8	57.8	41.8	2.41	1	08	23	N.W.	38	N.W.	5.433		
Dec.	29.766	29.723	29.763	29.751	30.243	19	29.139	6	1.104	38.4	39.3	35.9	36.2	63.6	14	—2.2	19	105.8	143.1	29.7	8.99	2	65	27	28	33	W.	31	N.	7.096
Sums	254.421	254.007	254.214	254.215					13.679	634.2	754.4	679.5	680.6						1557.4	1782.4	601.0	51.68								50.489
Means	29.702	29.697	29.694	29.694	30.258	6	29.030	11.4	.722	52.6	62.9	56.6	57.4	92.0	23	—16.0	5	46.4	65.2	50.1									8.	

* January.

† April.

‡ See L. R. 299, Obs., 1885.

§ June.

|| July.

CAIRO, ILL.—Continued.

Month	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Dew-point.										Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	North.					Northeast.					East.					Southeast.					South.					Southwest.					West.					Northwest.					Number of calm.					Washington time.				Clear.				Fair.				Cloudy.				On which .01 inch or more precipitation fell.				Maximum below 32°.				Minimum below 32°.				Maximum above 90°.				Thunder-storms.				Highest.				Date.				Lowest.				Date.				Range.				Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calm.					7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Ft. In.	Ft. In.	Date.	Lowest.	Date.	Range.	Ft. In.	Ft. In.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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* See L. R. 209 Obe., 1885.

† February.

‡ September.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.12 a. m., 2.12 p. m., and 10.12 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.046 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.420; February, 0.420; March, 0.420; April, 0.410; May, 0.400; June, 0.390; July, 0.380; August, 0.390; September, 0.400; October, 0.400; November, 0.420; December, 0.420.

REMARKS.—Mississippi froze over on January 5, temperature 1° below zero, lowest temperature on record. Destructive tornado on February 19. Ice on Mississippi River began breaking up on February 2, and was clear of ice on 4th. Last snowfall March 9. Last frost April 2. First frost October 24. First snowfall November 27. Navigation on Mississippi closed December 18. Cold spell on 19th December, minimum temperature 2.2° below zero.

Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CANBY, FORT, WASH.

Location of office on December 31, 1884, seventy-five yards east of Cape Disappointment light-house.

[Latitude, 46° 16' N.; longitude, 124° 4' W. Elevation of barometer above sea-level, 179 feet. Elevation of exposed thermometer above ground 7 feet. Elevation of rain gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.		Total movement						
	Washington time.					Self-registering ther- mometers.					Any 3 con- secutive 8-hourly measure- ments.		Prevailing direction.		Maximum hourly velocity during month.		W.												
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Last		Date.	Miles.	Direction	Date.								
1884.	In.	In.	In.	In.	In.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Absolute range. <th>Mean maximum.</th> <th>Mean minimum.</th> <th>Total amount.</th> <th>Last</th> <th>Date.</th> <th>Miles.</th> <th>Direction</th> <th>Date.</th> <th>W.</th>	Mean maximum.	Mean minimum.	Total amount.	Last	Date.	Miles.	Direction	Date.	W.				
Jan.	29.867	29.903	29.879	29.890	30.312	23	29.201	26	1.111	41.6	43.1	43.0	42.6	55.0	6	32.3	15	22.7	46.6	38.2	6.45	17	3	72	SE.	6	11,563		
Feb.	29.831	29.827	29.810	29.823	30.317	26	29.143	19	1.174	35.1	40.0	39.4	38.2	65.0	9	38.2	11	52.0	44.6	33.0	6.20	11	23	64	S.	19	7,714		
Mar.	29.734	29.735	29.725	29.731	30.124	20	29.216	9	.908	41.3	46.5	44.3	44.0	64.2	14	40.9	14	37.3	56.8	45.9	2.18	.86	24	25	42	SE.	22	5,710	
Apr.	29.744	29.749	29.740	29.744	30.091	8	29.338	13	.763	48.0	52.8	50.6	50.4	78.2	7	40.9	14	37.3	56.8	45.9	2.98	.92	2	48	SE.	2	7,129		
May	29.853	29.858	29.835	29.849	30.093	28	29.903	18	.492	50.7	56.2	53.3	53.4	78.0	18	42.6	5	33.4	59.5	48.5	1.30	.57	4	50	S.	4	6,717		
June	29.788	29.802	29.708	29.790	29.977	15	29.566	21	.411	52.9	57.3	55.4	55.2	98.0	17	47.6	2	20.4	60.8	51.3	2.16	.78	18	19	45	SE.	24	6,574	
July	29.877	29.896	29.874	29.880	30.023	28	29.625	13	.398	58.0	61.7	58.2	58.6	73.2	26	51.0	17	22.2	65.1	54.3	1.73	.65	16	19	S.	5	4,239		
Aug.	29.834	29.832	29.835	29.840	30.073	28	29.618	2	.415	58.0	64.0	60.1	60.7	90.3	2	50.6	20	38.7	67.5	55.6	1.23	.80	26	27	34	SE.	13	5,603	
Sept.	29.804	29.811	29.803	29.806	30.035	26	29.498	7	.557	53.7	57.4	54.8	55.3	84.0	6	42.5	30	21.5	60.2	50.7	6.22	1.41	9	10	48	SE.	8	6,767	
Oct.	29.896	29.849	29.830	29.840	30.248	25	29.247	12	1.001	50.5	54.4	52.5	52.5	87.0	16	42.0	14	25.0	57.1	46.8	6.24	1.13	8	9	56	S.	10	8,868	
Nov.	29.848	29.850	29.847	29.850	30.151	26	29.579	6	.572	49.2	52.7	50.8	50.9	94.0	12	38.7	22	23.3	55.1	46.8	4.05	1.37	3	4	53	SE.	23	8,648	
Dec.*	29.725	29.743	29.699	29.732	30.237	7	29.874	18	1.363	34.7	38.3	36.4	36.5	54.0	3	21.0	24	33.0	41.7	32.0	5.91	2.77	18	10	104	E.	16	10,348	
Some	257.70	257.872	257.681	257.771	30.237	28	29.874	118	9.155	571.7	624.4	598.8	598.4	734.4	118	51.0	111	30.3	363.2	603.1	543.0	45.71	.....	.....	.....	.....	.....	99,779
Means	29.813	29.823	29.807	29.814	30.317	126	29.874	118	.763	47.6	52.0	49.9	49.8	90.3	62	40.0	111	30.3	55.4	45.2

* Two 3 p. m. observations missed. † February. ‡ December. § August. || February.

CANNRY, FORT, WASH.—Continued.

[illegible]

Two 3 p. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.52 a. m., 11.52 p. m., and 7.52 p. m., local time. Correction for instrumental use of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, inclusive — .003.

Correction for instrumental error of altimeter used: From 7 A.M., January 1, to 11 P. M., December 31, inclusive — .000.

The barometric observations may be reduced to sea-level by the following constants for the various months: January, 0.20; February, 0.20; March, 0.20; April, 0.20; May, 0.20; June, 0.19; July, 0.18; August, 0.19; September, 0.20; October, 0.20; November, 0.20; December, 0.20.

JNO. F. HEMENWAY,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

• CAPE HENRY, VA.

Location of office on December 31, 1884, 50 yards east of lighthouse.

[Latitude, 38° 56' N.; longitude, 76° 0' W. Elevation of barometer above sea-level, 16 feet. Elevation of exposed thermometer above ground, 15 feet. Elevation of rain-gauge above ground, 6 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.					
Washington time.					Monthly mean.					Washington time.					Self-registering thermometer.					Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.			
7 p. m.	3 p. m.	11 p. m.			Month.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	In.	Date.	Miles.	Direction from —	Date.			
1884.																											
Jan.	30.101	30.132	30.139	30.144	30.805	27	29.293	8	1.522	33.6	39.2	36.1	36.3	68.0	24	12.0	5.6	56.0	44.6	28.5	8.43	1.68	8	SE.	8	NW.	11,509
Feb.	30.087	30.056	30.101	30.081	30.657	16	29.324	29	1.333	45.8	48.7	45.5	46.7	74.0	6	18.0	29	55.0	55.6	38.9	8.31	1.63	20	NW.	23	S.	8,906
Mar.	30.047	30.001	30.040	30.039	30.478	16	29.472	29	.976	44.7	49.8	45.9	46.8	76.0	26	22.0	1.4	54.0	54.9	39.2	7.85	1.40	13	NW.	31	NW.	10,078
Apr.	29.897	29.858	29.902	29.896	30.244	12	29.165	2	1.079	48.7	53.4	49.9	52.0	79.0	29	36.0	12	41.0	53.5	44.9	2.89	1.09	22	NW.	9	NW.	9,008
May	29.894	29.943	29.967	29.965	30.319	3	29.673	11	.646	63.4	70.3	62.9	65.2	92.0	2	47.1	30	44.9	73.5	55.2	78	.31	6	SE.	14	SE.	8,860
June	30.064	30.034	30.042	30.047	30.369	15	29.605	9	.674	63.5	78.3	68.4	71.1	89.8	21	51.4	3	38.4	76.2	64.6	2.52	.21	30	NW.	6	SE.	8,919
July	29.909	29.873	29.893	29.892	30.119	22	29.671	13	.448	72.7	80.0	73.2	75.0	94.2	24	63.5	17	33.7	83.4	69.7	2.56	.92	6	NW.	6	S.	8,199
Aug.	30.048	30.027	30.038	30.037	30.254	25	29.718	30	.536	72.1	80.4	72.8	75.1	91.8	21	64.9	15	28.9	82.3	69.7	2.56	.92	6	NW.	7	NE.	8,385
Sept.	30.133	30.089	30.117	30.113	30.378	14	29.745	17	.633	60.8	80.9	70.7	73.9	90.5	9	60.5	20	30.0	82.1	67.4	.42	.28	25	NW.	14	S.	8,472
Oct.	30.167	30.120	30.141	30.143	30.576	26	29.774	8	.802	61.1	69.9	63.6	64.9	86.0	5	39.2	25	46.8	73.8	63.8	.74	.59	23	NW.	23	N.	9,707
Nov.	30.110	30.064	30.086	30.087	30.495	22	29.429	28	.996	48.7	57.1	52.8	53.2	73.8	2	36.0	23	37.8	61.9	46.6	.58	.28	28	NW.	5	NE.	8,874
Dec.	30.177	30.138	30.161	30.162	30.594	20	29.637	6	.937	41.9	48.1	44.7	44.9	71.8	12	15.3	19	56.5	52.9	38.1	3.49	1.01	21	NW.	9	N.	11,188
Sum.	300.704	300.335	300.627	300.596	.....	.....	.....	10.590	672	757	688	5705	.....	.....	.....	.....	621	6092	7624	41.01	.....	.....	.....	.....	.....	.....	111,562
Means.	30.068	30.028	30.052	30.049	30.805	27	29.166	.....	1.082	50.0	63.1	57.1	58.7	90.2	24	13.0	5.6	43.4	60.9	52.0	.....	.....	.....	.....	.....	.....	8.

* January.

† April.

‡ July.

CAPT. HENRY, VA.—(Continued.)

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Percentages.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which at least one inch of precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.04 a. m., 3.04 p. m., and 11.04 p. m., local time.

Correction for instrumental error of barometer used: From 7.04 a. m., December 31, 1884, inclusive, to 11.04 p. m., January 1, 1884, inclusive, $+0.016$ inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .020; February, .020; March, .020; April, .020; May, .020; June, .020; July, .020; August, .020; September, .020; October, .020; November, .020; December, .020.

1520: May, polar bands on
1530: heavy rains during month.
1540: August, lunar halo on 6th.
1550: severe thunder-storms during month.
1560: lunar halo on 2d, 3d, 6th, 8th, and 28th. October,
1570: 21c meteors fell on 19th. September; very dry weather during the month; solar halo on 4th, 6th, and 28th. October,
1580: extremely dry weather during first of month; aurora on 1st from 10 to 11 p. m. November, solar halo on 27th; lunar halo on 25th and 27th. December
1590: rainbow on 31st; solar halo on 4th and 31st.
1600: lunar halo on 23d; lunar halo on 4th and 31st.

WM. DAVIS.

W. M. DAVIS, U. S. A.
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CAPE MAY, N. J.

Location of office on December 31, 1884, Bay Side.

[Latitude, 38° 50' N.; longitude, 74° 58' W. Elevation of barometer above sea-level, 27 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 6 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.		Wind.		Total movement.									
Washington time.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.								
7 a. m.	3 p. m.	11 p. m.	Monthly mean.	High.	Date.	Low.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Total amount.			Last amount.	Date.	Miles.	Direction from—				
1884.																												
Jan.	30.139	30.035	30.105	30.110	30.777	29.777	27	29.228	9	1.549	30.1	31.3	31.650	5	2	11.0	6	39.5	38.0	34.4	5.56	27	8	NW.	3	NW.	14.311	
Feb.	30.055	30.028	30.072	30.052	30.656	29.125	28	1.531	37.9	42.3	38.4	39.554	07.14	13.0	29.41	05.5	29.41	41.0	45.4	22.7	28.05	23	23	NW.	23	NW.	12.396	
Mar.	30.016	29.954	29.999	29.960	30.421	29.448	26	0.973	37.9	42.3	39.7	40.054	5	29.13	0	41.0	41.0	45.4	22.7	28.05	23	23	NW.	23	NW.	12.690		
Apr.	29.846	29.810	29.845	29.834	30.183	29.168	21	1.015	46.0	51.4	47.1	48.263	5	29.32	0	31.5	54.1	41.8	24.0	80.0	27	78	10	NW.	10	NW.	11.681	
May	29.942	29.911	29.926	29.926	30.260	29.591	11	0.669	57.7	63.8	58.0	59.890	5	29.43	0	30.37	60.2	53.0	19.0	80.0	20	48	11	NW.	11	NW.	10.223	
June	30.045	30.026	30.029	30.034	30.383	29.679	26	0.704	65.7	72.0	65.1	67.684	0	22.40	0	10.37	74.5	60.9	13.4	13.4	20	48	11	NW.	11	NW.	8.449	
July	29.898	29.826	29.844	29.846	30.012	29.016	13	0.996	70.0	76.1	71.2	72.789	0	23.02	0	19.17	78.4	67.1	11.3	11.3	20	48	11	NW.	11	NW.	10.133	
Aug.	30.031	30.003	30.016	30.017	30.248	29.710	30	0.538	71.2	76.3	70.6	72.785	0	27.47	0	14.36	78.4	65.3	13.0	13.0	20	48	11	NW.	11	NW.	8.180	
Sept.	30.107	30.066	30.078	30.084	30.513	29.729	17	0.785	67.9	75.3	69.4	70.984	0	27.47	0	14.36	78.4	65.3	13.0	13.0	20	48	11	NW.	11	NW.	8.180	
Oct.	30.144	30.097	30.114	30.118	30.571	29.749	8	0.822	58.3	63.9	59.8	60.365	0	27.47	0	14.36	78.4	65.3	13.0	13.0	20	48	11	NW.	11	NW.	9.218	
Nov.	30.084	30.033	30.046	30.034	30.432	29.373	28	1.059	43.5	52.0	47.4	48.369	0	22.0	0	25.47	40.5	30.2	10.0	10.0	20	48	11	NW.	11	NW.	11.818	
Dec.	30.165	30.114	30.137	30.130	30.607	29.603	6	1.004	38.1	43.4	39.6	40.098	0	3.46	0	20.54	40.5	30.2	10.0	10.0	20	48	11	NW.	11	NW.	12.567	
Sums	360.445	359.953	360.212	360.204	360.777	29.125	128	11.045	628.3	691.3	631.3	651.3	631.3	691.3	631.3	651.3	470.17	296.4574	4.42	50	134.684
Means	30.037	29.996	30.018	30.017	30.777	29.125	128	1.045	628.3	691.3	631.3	651.3	631.3	691.3	631.3	651.3	39.2	60.5	47.9

January.

February.

July.

December.

CAPE MAY, N. J.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point.				Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—															
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.			Mean.			Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.									
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.										11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.			
1884.																																	
Jan.....	11	9	7	2	15	14	5	30	0	24.5	27.5	28.1	26.0	80.1	78.6	81.2	80.0	6.0	7.6	5.0	6.2	6	14	11	16	7	25	0	0	0	0	0	
Feb.....	4	13	16	8	16	3	7	20	0	33.7	37.4	33.9	33.0	84.8	83.1	84.0	84.0	6.1	5.2	5.3	5.5	5	16	8	17	1	11	0	1	0	0	0	
Mar.....	5	14	9	10	12	1	11	30	1	33.5	36.3	35.1	35.0	84.6	80.4	83.6	82.9	5.1	5.7	4.2	5.0	9	14	8	17	3	8	0	3	0	0	0	
Apr.....	7	7	10	8	7	4	16	29	2	39.5	43.8	41.6	41.6	79.1	76.1	81.7	79.0	5.3	5.9	5.7	5.6	5	15	10	11	0	0	0	0	0	0	0	
May.....	4	7	4	13	28	9	10	18	0	51.5	52.2	51.1	51.0	81.0	68.8	78.8	76.2	4.3	4.7	4.1	4.4	13	12	6	8	0	0	0	0	1	0	0	
June.....	0	18	14	16	25	4	4	7	2	60.3	61.8	60.6	60.9	82.7	71.1	85.5	79.8	4.2	4.2	3.4	3.9	16	7	7	6	0	0	0	0	0	0	0	0
July.....	4	4	8	10	28	6	10	21	1	64.7	67.4	66.2	65.9	82.6	74.9	88.5	80.9	4.8	4.9	5.5	5.1	17	19	5	10	0	0	0	0	0	0	0	0
Aug.....	6	19	10	14	27	6	7	2	7	67.4	68.7	66.9	67.7	88.0	78.1	88.6	84.9	5.3	5.0	4.8	5.0	10	12	9	7	0	0	0	0	0	0	0	0
Sept.....	7	6	8	35	19	2	7	0	0	62.6	65.8	63.1	63.8	83.3	73.3	80.7	79.1	1.5	2.7	1.8	2.0	21	17	2	9	0	0	0	0	0	0	0	0
Oct.....	17	9	8	5	19	16	7	12	0	50.9	54.4	51.5	52.3	77.4	72.9	77.5	75.9	3.8	4.0	3.8	3.9	14	13	4	9	0	0	0	0	0	0	0	0
Nov.....	8	12	3	6	8	14	15	22	2	30.2	43.4	41.2	41.3	79.0	74.4	79.5	77.6	3.6	4.9	3.7	4.1	14	14	10	6	9	0	2	0	0	0	0	
Dec.....	25	7	5	5	12	13	7	18	1	32.4	36.0	33.7	34.0	79.9	78.7	79.4	79.3	6.5	6.7	6.2	6.5	7	8	16	10	3	10	0	1	0	0	0	
Sums ..	97	126	100	105	230	112	96	221	11	559.7	594.7	571.0	575.1	962.5	910.4	985.5	959.6	56.5	61.5	53.5	57.2	127	147	92	122	14	56	0	15	0	0	0	0
Means .	Percentages.									46.6	49.6	47.6	47.9	81.9	75.9	82.1	80.0	4.7	5.1	4.5	4.8	34.7	40.2	25.1	33.3	3.8	15.3	0.4	1	0	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.08 a. m., 3.08 p. m., and 11.08 p. m., local time.
 Correction for instrumental error of barometer used: From 7.08 a. m., January 1, to 11.08 December 31, 1884, inclusive, —.002 inch.
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030;
 April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.
 REMARKS.—Last frost, March 16; first frost, October 10. Last snow, March 5; first snow, December 18.

W. EASBY SMITH,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CAPE MENDOCINO, CAL.

Location of office on December 31, 1884, on mountain east of light-house.

[Latitude, 40° 20' N.; longitude, 124° 24' W. Elevation of barometer above sea-level, 537 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain gauge, above ground, 1 foot.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.			Wind.			Total movement.																								
Washington time.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																										
7 P. M.		3 P. M.		11 P. M.	Monthly mean.		Highest.	Lowest.	Date.	Range.	7 A. M.	3 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.		Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	SE.	Miles.																
1884.																																													
Jan.		29.384		29.391		29.363		29.370		29.733		29.733		28.583		26		1.150		45.9		50.1		48.3		48.1		51.5		29		35.0		43.5		1.27		48		SE.		4.5		13,160	
Feb.		29.278		29.308		29.273		29.286		29.748		29.748		28.584		16		1.164		42.5		48.2		46.4		45.7		45.7		12		40.0		51.6		40.3		SE.		4.5		28,471			
Mar.		29.257		29.257		29.268		29.261		29.622		29.622		28.442		9		1.180		43.9		51.1		47.6		47.5		47.5		11		37.5		53.7		41.7		NW.		9		15,133			
Apr.		29.271		29.254		29.281		29.278		29.575		29.575		28.875		10		7.00		46.0		52.3		48.8		49.0		49.0		27		24.8		54.2		43.8		SE.		25		12,607			
May		29.309		29.316		29.311		29.312		29.497		29.497		28.124		18		3.73		49.4		55.0		51.6		51.6		51.6		4		27.4		58.2		47.2		NW.		23		16,385			
June		29.299		29.309		29.308		29.305		29.552		29.552		28.058		11		4.94		51.6		57.6		54.6		54.6		54.6		6		18.3		60.5		50.5		N.		30		16,448			
July		29.344		29.358		29.343		29.348		29.488		29.488		28.163		12		8.25		53.2		57.9		55.5		55.5		55.5		11		47.2		63.2		51.3		SE.		10		13,419			
Aug.		29.303		29.312		29.302		29.306		29.474		29.474		28.149		11		3.25		53.7		59.0		57.1		56.6		56.6		1		21.7		63.2		51.3		N.		2		12,942			
Sept.		29.328		29.337		29.331		29.332		29.497		29.497		28.080		30		4.17		52.9		58.6		55.5		55.5		55.5		30		23.0		61.7		50.8		N.		12		12,942			
Oct.		29.246		29.354		29.348		29.349		29.543		29.543		28.927		12		6.16		50.7		56.9		54.9		54.9		54.9		2		33.6		60.9		48.1		N.		16		12,942			
Nov.		29.367		29.383		29.384		29.371		29.582		29.582		28.153		10		4.29		50.5		55.9		54.1		53.5		53.5		8		43.0		60.8		48.6		N.		10		12,942			
Dec.		29.204		29.235		29.200		29.213		29.596		29.596		28.546		25		1.053		46.7		50.2		49.3		48.7		48.7		29		30.6		54.0		44.5		S.		16		416,870			
Sums.		351.692		351.644		351.692		351.741		351.741		351.741		28.442		9		8.236		58.7		65.2		62.4		62.1		62.1		512		38.1		560.8		46.7		N.		10		13,160			
Means.		29.308		29.320		29.308		29.312		29.748		29.748		28.442		9		6.686		46.9		54.4		52.0		51.8		51.8		733		38.5		57.6		46.7		N.		10		13,160			
For 234 days.																																													
Anemometer unserviceable.																																													
For 10 days only.																																													
For 29½ days.																																													
February.																																													
March.																																													
October.																																													

For 234 days.

Anemometer unserviceable.

For 19 days only.

For 29½ days.

February.

March.

October.

CAPE MENDOZINO, CAL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—							Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.			Northwest.	Number of calms.	Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
												7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.										3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.51 a. m., 11.51 a. m., and 7.51 p. m., local time.

Corrections for instrumental error of barometer used: From 3.51 a. m., January 1 to 7.51 p. m., September 30, inclusive, +.041 inch; from 3.51 a. m., October 1 to 7.51 p. m., December 31, inclusive, +.036 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.700; February, 0.700; March, 0.680; April, 0.680; May, 0.680; June, 0.680; July, 0.680; August, 0.680; September, 0.680; October, 0.680; November, 0.700; December, 0.700.

REMARKS.—Instrumental error of barometer No. 346 changed by authority L. E., dated O. C. S. O., September 30, 1884.

A. P. LEAVITT,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CEDAR KEYS, FLA.

Location of office on December 31, 1884, rooms Nos. 8 and 9, northwest corner of Second and C streets.

[Latitude, 29° 8' N.; longitude, 83° 2' W. Elevation of barometer above sea-level, 22 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 35 feet.]

Month.	Barometric readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.											
	Washington time.			Monthly mean.			Washington time.				Self-registering thermometers.			Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.											
	7 a.m.	3 p.m.	11 p.m.	In.	In.	In.	Date.	Lowest.	Date.	Range.	7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Date.	Direction	Miles.	Date.	Miles.	Total movement.		
1884.																														
Jan.....	30.241	30.181	30.234	30.210	30.561	21.29	763	8	798	In.	56.3	56.6	51.6	51.6	98.9	27.25	2	6	43.7	69.3	44.1	5.08	1.17	1	85	NW.	2	NW.	6.859	
Feb.....	30.147	30.092	30.129	30.123	30.323	10.29	785	28	538	In.	45.9	68.3	68.3	62.5	63.4	47.4	12.37	29	40.2	69.8	57.2	1.56	.69	17	18	40	SW.	20	SW.	6.186
Mar.....	30.106	30.066	30.092	30.068	30.341	4.29	830	1	511	In.	62.3	71.3	66.6	66.6	67.8	9	23.22	1	38.7	73.1	60.8	2.21	.77	14	40	S.	19	S.	8.020	
Apr.....	30.001	29.973	29.998	29.987	30.206	29.29	813	5	563	In.	63.0	73.5	68.4	69.0	64.8	8	18.50	7	10	34.1	75.0	62.7	3.58	.35	5	6	SW.	2	SW.	7.536
May.....	30.016	29.987	30.005	29.993	30.197	3.29	819	26	378	In.	81.5	81.5	75.0	77.0	90.0	21.60	5	31	29.5	82.7	70.5	1.96	.91	18	31	NE.	2	NE.	7.006	
June.....	30.000	29.965	29.989	29.985	30.143	27.29	742	22	401	In.	75.0	83.1	76.5	78.0	91.0	26.02	0	1	29.0	84.7	71.2	6.08	1.80	29	36	SE.	23	SE.	6.885	
July.....	29.938	29.972	29.987	29.985	30.132	24.29	828	8	308	In.	80.8	80.8	80.7	82.0	91.0	8	20	70.0	87.6	76.8	6.02	1.29	1	25	SW.	23	SW.	6.811		
Aug.....	30.013	29.971	30.018	30.001	30.167	19.29	829	30	338	In.	78.2	86.0	79.0	81.2	92.5	3.09	9	5	22.0	88.1	74.4	8.11	2.00	5	25	SW.	21	NE.	6.002	
Sept.....	30.043	29.990	30.016	30.026	30.203	26.29	876	1	327	In.	76.4	86.0	72.5	80.3	90.0	1.2	7	66.9	86.9	73.6	3.63	1.29	1	32	NE.	30	NE.	6.281		
Oct.....	30.075	30.015	30.073	30.051	30.297	24.29	853	9	441	In.	69.3	81.0	72.5	74.8	89.0	1.2	8	52.7	82.1	67.2	1.13	.10	21	26	NE.	15	NE.	7.285		
Nov.....	30.087	30.030	30.046	30.068	30.225	11.29	707	28	518	In.	69.2	69.2	62.6	63.7	78.0	2.42	0	25	36.0	71.8	54.9	3.06	1.23	27	81	NE.	28	NE.	6.002	
Dec.....	30.134	30.080	30.120	30.111	30.316	19.29	782	6	534	In.	57.0	65.2	59.9	60.7	74.1	30.32	2	19	41.9	66.6	55.1	5.66	3.72	5	28	NW.	18	NW.	5.774	
Sums.....	360.861	360.322	360.768	360.051	360.551	.....	.....	.....	.....	.....	907.6	833.9	848.6	.....	.....	.....	.....	.....	.....	.....	977.0	547.68	.....	.....	.....	.....	.....	.....	79.147
Means.....	30.072	30.027	30.064	30.054	30.561	+21.29	813	15	474	In.	67.0	75.6	69.5	70.7	82.5	77.3	64.2	W.

* January.

† April.

‡ August.

CEDAR KEYS, FLA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time; Number of times observed blowing from—							Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).			Number of days—										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Mean.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Aurora.		
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.										11 p. m.	Mean.
1884.																									
Jan.....	9	18	0	2	14	4	14	22	42.9	49.7	46.8	46.5	86.6	79.3	83.9	83.3	15	11	5	0	5	0	1	0	
Feb.....	5	11	10	5	17	13	14	12	54.7	57.0	57.3	56.3	86.0	89.0	84.1	79.7	19	13	5	0	0	0	3	0	
Mar.....	5	7	16	10	26	14	10	9	57.0	60.6	51.3	59.0	83.9	71.9	83.6	79.6	10	20	1	0	0	0	0	0	
Apr.....	6	2	6	2	19	16	20	13	57.0	59.1	60.0	58.7	77.0	62.5	75.5	71.7	3	9	5	0	0	0	5	0	
May.....	9	7	6	5	17	39	5	0	67.5	66.9	66.8	67.1	79.0	62.0	75.6	72.2	20	8	3	0	0	0	0	0	
June.....	4	14	16	4	16	20	9	3	69.1	69.0	69.5	69.2	82.5	63.9	79.6	75.3	3	22	6	0	0	0	1	0	
July.....	4	11	1	2	3	30	37	4	74.0	72.3	73.4	73.6	80.6	67.8	79.4	75.9	11	3	3	0	0	0	0	0	
Aug.....	7	28	11	5	4	13	18	5	73.1	72.7	72.8	72.9	85.0	65.0	82.0	77.3	11	18	2	0	0	0	0	0	
Sept.....	11	32	14	6	3	7	13	4	71.0	71.5	70.9	71.1	83.9	62.4	77.9	74.7	2	17	3	0	0	0	0	0	
Oct.....	21	32	19	0	2	2	9	7	63.9	65.0	64.9	64.8	83.7	59.7	77.8	73.7	0	0	0	0	0	0	0	0	
Nov.....	23	23	12	4	4	4	10	7	62.8	56.7	54.6	54.7	80.9	67.0	76.5	74.8	7	0	2	0	0	0	0	0	
Dec.....	15	21	15	6	18	2	8	7	53.5	57.4	55.3	55.4	88.4	77.1	85.1	83.5	16	8	7	0	0	0	0	0	
Sums..	119	200	124	52	131	142	213	98	736.5	759.5	753.6	749.9	997.5	807.0	921.7	41.7	177	148	41	101	0	5	13	34	0
Percentages.																	Percentages.								
Means.	10.8	18.8	11.3	4.7	11.9	12.9	19.4	8.9	61.4	63.3	62.8	62.5	83.1	67.2	80.1	76.8	48.4	40.4	11.2	27.6	0	1.4	3.6	9.3	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.36 a. m., 2.36 p. m., and 10.36 p. m., local time. Corrections for barometric error have been made from the mean of the observations for January 1 to 11 p. m., December 31, 1884, inclusive, + .002 inch. The barometric observations have been reduced to sea level by adding the following constants for the various months: January, .020; February, .020; March, .020; April, .020; May, .020; June, .020; July, .020; August, .020; September, .020; October, .020; November, .020; December, .020.

REMARKS.—January 6, 1884, was the coldest day (+ 25° 2) for many years. Orange trees were killed throughout a great portion of the state, causing immense losses.

A. J. MITCHELL,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHARLESTON, S. C.

Location of office on December 31, 1884, corner East Bay and Broad streets.

[Latitude, 32° 47' N.; longitude, 79° 56' W. Elevation of barometer above sea level, 52 feet. Elevation of exposed thermometer above ground, 40 feet. Elevation of rain-gauge above ground, 33 feet.]

Month.	Barometric readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.					Monthly mean.					Self-registering thermometers.					Any 3 consecutive hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	7 a. m.	3 p. m.	11 p. m.	Highest.	Lowest.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Date.	Miles.		Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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* One 7 a. m. observation missed.

January.

: April.

\$ July.

|| 294 days.

¶ 364 days.

CHARLESTON, S. C.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Number of calms.	Dew-point.								Relative humidity (per cent.).				Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.		Washington time.								Relative humidity (per cent.).				Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
											7 a. m.				3 p. m.				11 p. m.				Mean.				7 a. m.					3 p. m.					11 p. m.					Mean.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum below 50°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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1884.	10	13	8	1	2	27	15	16	1	38.3	40.1	39.4	39.3	85.6	87.0	79.9	77.5	5.9	5.8	4.4	5.4	10	11	14	10	13	7	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.43 a. m., 2.48 p. m., and 10.48 p. m., local time.
Correction for instrumental error of barometer used: From 6.48 a. m., January 1, to 10.48 p. m., December 31, 1884, inclusive, —.028.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .060; February, .060; March, .060; April, .060; May, .060; June, .060; July, .060; August, .060; September, .060; October, .060; November, .060; December, .060.

J. H. SMITH,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHARLOTTE, N. C..

Location of office on December 31, 1884, third floor Traders' National Bank.

[Latitude, 35° 13' N.; longitude, 80° 51' W. Elevation of barometer above sea-level, 808 feet. Elevation of exposed thermometer above ground, 85 feet. Elevation of rain-gauge above ground, 47 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.		Total movement.										
	Washington time.			Monthly mean.	Hiqhest.	Date.	Lowest.	Date.	Range.	Washington time.			Monthly mean.	Self-registering ther- mometers.			Mean maximum.	Mean minimum.	Total amount.	Last 8 hours.		Date.	Miles.	Direction from—	Maximum hourly velocity during month.	Prevailing direction.					
	7 p.m.	3 p.m.	11 p.m.							7 a.m.	3 p.m.	11 p.m.		Maximum.	Date.	Minimum.											Date.	Absolute range.			
1884.																															
Jan.	29.328	29.291	29.300	29.304	29.907	27.28	619	8	1.288	33.8	42.8	38.8	38.5	62.8	1	5	0	6	57.8	46.7	30.5	7.60	1.83	11	12	23	W.S.	2	W.	4,977	
Feb.	29.248	29.226	29.230	29.264	29.725	26.885	27	1,040	33.6	57.6	50.6	53.7	51.8	9	17	8	29	57.8	46.7	30.5	7.60	1.83	11	12	23	W.S.	26	S.W.	4,903		
Mar.	29.205	29.164	29.185	29.185	29.568	26.765	28	801	51.4	59.4	56.3	53.7	51.8	25	23	0	9	52.0	62.6	45.2	9.10	0.25	25	26	27	W.S.	25	S.W.	5,115		
Apr.	29.111	29.056	29.080	29.082	29.348	26.548	12	801	51.4	64.2	56.3	53.7	51.8	28	28	4	9	43.4	64.7	47.8	5.04	2.94	21	22	33	W.	25	S.W.	4,140		
May	29.176	29.121	29.134	29.134	29.401	26.881	11	520	63.9	77.0	68.9	69.9	68.8	23	48	6	30	41.9	78.9	60.2	4.84	2.24	25	26	27	W.	22	S.W.	3,675		
June	29.234	29.192	29.205	29.211	29.499	26.873	10	626	66.6	76.5	68.9	70.7	69.1	21	51	5	15	39.5	78.9	62.9	4.47	2.84	11	22	23	W.	22	N.E.	3,820		
July	29.133	29.085	29.100	29.106	29.317	27.076	16	841	72.1	84.8	73.0	77.2	75.3	25	60	8	8	32.5	84.5	68.4	7.00	3.10	1	2	14	N.W.	21	N.E.	3,813		
Aug.	29.249	29.197	29.208	29.218	29.389	26.846	80	443	69.3	82.7	73.0	75.9	73.4	20	58	0	14	32.5	84.5	68.4	7.00	3.10	1	2	14	N.W.	21	N.E.	3,813		
Sept.	29.320	29.268	29.301	29.308	29.531	26.957	17	474	66.1	80.1	71.5	72.8	70.1	9	49	4	15	41.4	81.9	64.3	3.97	3.38	11	12	17	N.E.	13	N.E.	3,245		
Oct.	29.360	29.297	29.326	29.328	29.678	26.955	8	623	59.5	75.1	64.6	66.4	64.1	0	36	0	8	55.9	76.4	64.6	1.51	1.26	30	31	16	N.	15	N.	3,254		
Nov.	29.302	29.241	29.265	29.269	28.597	27.28	690	28	937	43.2	58.6	49.7	50.6	73.8	8	29	2	7	48.9	60.5	41.3	4.73	2.75	28	29	23	N.	23	N.	3,685	
Dec.	29.341	29.291	29.327	29.329	27.735	27	801	6	834	39.1	49.4	43.7	41.1	71.0	12	11	0	19	60.0	52.4	35.8	5.73	1.83	21	22	24	S.	6	N.E.	3,881	
Sums	251,000.350	429.350	468.350	468.350	701	8,830	658	6,899	0	711	6	728	5	565	0	838	7	68.14	45,458
Means	29.250	29.202	29.222	29.225	29.907	27.267	12	736	54.9	67.4	59.3	60.5	68.4	4	5.0	16	47.1	68.7	51.9
											† January.						† April.						† July.								
											*304 days.																				

CHARLOTTE, N. C.--Continued.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.45 a. m., 2.45 p. m., 10.45 p. m., local time.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.890; February, 0.880; March, 0.880; April, 0.860; May, 0.840; June, 0.830; July, 0.830; August, 0.830; September, 0.840; October, 0.860; November, 0.880; December, 0.890.

D. O'DONOGHUE,
Sergeant, Signal Corps, U. S. A.

D. O'DONOGHUE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHATTANOOGA, TENN.

Location of office on December 31, 1884, northeast corner third floor Hamilton County court-house.

[Latitude, 35° 4' N.; longitude, 85° 15' W. Elevation of barometer above sea-level, 783 feet. Elevation of exposed thermometer above ground, 43 feet. Elevation of rain-gauge above ground, 59 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.					Self-registering thermometers.					Mean maximum.		Mean minimum.		Total amount.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Monthly mean.					Range.					Lowest.		Highest.		Date.		Date.		Direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	7 a. m.	3 p. m.	11 p. m.	In.	Th.	In.	Th.	Lowest.	Highest.	Th.	In.	Th.	In.	Th.	Lowest.	Highest.	Th.	In.	Th.	In.		Th.		Miles.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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* January.

† November.

‡ August.

CHATTANOOGA, TENN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—						River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.		Number of calms.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	On which more precipitation fell.	Minimum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.		Number of calms.		7 a. m.		3 p. m.		11 p. m.		Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1884.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Sums.	Percentages.										Percentages.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
9	17	7	3	4	17	9	21	22	9	37	1	23	587	5	602	6	508	2	599	5	1008	8	691	6	928	9	876	1	64	9	75	8	54	1	64	9	95	150	121	141	4	48	13	47

† October.

* March.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.27 a. m., 2.27 p. m., and 10.27 p. m., local time. Corrections for instrumental error of barometer used: From 6.27 a. m., January 1, to 2.27 p. m., March 29, inclusive, +.003 inch; from 6.27 p. m., March 29, to 10.27 p. m., December 31, 1884, inclusive, -.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.860; February, 0.860; March, 0.860; April, 0.859; May, 0.859; June, 0.859; July, 0.860; August, 0.860; September, 0.860; October, 0.860; November, 0.860; December, 0.860.

Remarks.—Flood in Tennessee River passed danger line (33 feet) March 8; reached highest point since 1875 (43 feet) on March 11, and subsided below danger line March 15. Heated term in October of unusual intensity; maximum temperature over 90° on 3d, 4th, 5th, and 6th. A remarkably heavy sleet storm December 21, coating exposed objects with ice one-half inch thick.

B. L. GOULDING,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHEYENNE, WYO.

Location of office on December 31, 1884, Commercial Building.

[Latitude, 41° 8' N.; longitude, 106° 48' W. Elevation of barometer above sea-level, 6,105 feet. Elevation of exposed thermometer above ground, 58 feet. Elevation of rain-gauge above ground, 50 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																						
Washington time.					Self-registering thermometers.					Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																													
Washington time.					Self-registering thermometers.							Date.	Miles.		Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																												
7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.							8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.		Absolute range.	Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																			
1884.																			Miles.																																																																																																																																																																																																																																																																																																																																																																																																																								
Jan.....	23.903	23.930	23.977	23.963	24.297	20	23.602	9	.695	20.4	22.6	20.9	23.650	2	12	11.0	15	61.2	33.8	12.8	76.198	14	46	N.W.	31	N.W.	10,751																																																																																																																																																																																																																																																																																																																																																																																																																
Feb.....	23.840	23.855	23.862	23.859	24.161	26	23.287	18	.874	19.4	22.0	20.9	33.750	1	24	28.2	12	68.2	33.6	13.9	26.13	34	50	N.W.	20	N.W.	10,517																																																																																																																																																																																																																																																																																																																																																																																																																
Mar.....	23.819	23.812	23.840	23.824	24.160	13	23.231	10	.919	28.7	28.4	28.4	30.38.9	13	13	1.5	6	57.4	41.8	2.1	1.36	20	21	64	N.W.	27	N.W.	9,974																																																																																																																																																																																																																																																																																																																																																																																																															
Apr.....	23.909	23.912	23.931	23.918	24.212	19	23.558	13	.684	25.2	45.0	36.2	268.9	24	18	2	51.6	49.4	26.9	1.33	25	26	34	N.W.	7	N.W.	8,600																																																																																																																																																																																																																																																																																																																																																																																																																
May.....	24.027	24.016	24.014	24.029	24.300	8	23.703	4	.597	41.7	53.8	48.3	49.679.8	8	23	0	1	57.8	64.7	38.6	4.83	28	20	34	N.W.	10	N.W.	7,749																																																																																																																																																																																																																																																																																																																																																																																																															
June.....	24.083	24.081	24.089	24.084	24.272	18	23.829	11	.443	50.9	73.7	53.8	61.193.4	27	43	2	16	50.2	78.2	49.1	1.50	88	7	43	S.	28	S.	6,673																																																																																																																																																																																																																																																																																																																																																																																																															
July.....	24.101	24.081	24.092	24.091	24.298	8	23.968	21	.322	54.9	78.4	63.6	65.690.0	6	44	0	29	46.0	81.8	52.3	1.60	46	29	34	N.W.	29	N.W.	8,138																																																																																																																																																																																																																																																																																																																																																																																																															
Aug.....	24.142	24.131	24.145	24.139	24.330	3	23.800	19	.470	51.5	72.4	59.5	61.186.5	31	38	3	34	3	85.3	49.3	2.07	.96	18	19	38	N.W.	1	N.W.	6,741																																																																																																																																																																																																																																																																																																																																																																																																														
Sept.....	24.020	23.994	24.006	24.007	24.330	19	23.662	7	.668	46.0	69.0	54.6	56.582.5	1	28	5	30	54.0	72.8	42.8	1.25	1.01	14	15	42	N.W.	10	N.W.	8,596																																																																																																																																																																																																																																																																																																																																																																																																														
Oct.....	24.078	24.046	24.087	24.070	24.404	16	23.653	1	.787	38.4	60.7	43.6	47.678.8	2	9	4	27	67.4	63.2	33.8	.50	26	28	42	N.W.	5	N.W.	7,473																																																																																																																																																																																																																																																																																																																																																																																																															
Nov.....	24.064	24.052	24.084	24.067	24.300	7	23.625	7	.592	29.5	47.2	32.0	36.263.7	6	1	6	23	64.1	49.2	23.8	.18	.09	17	56	N.W.	28	N.W.	7,478																																																																																																																																																																																																																																																																																																																																																																																																															
Dec.....	23.813	23.802	23.834	23.816	24.201	8	23.302	21	.899	16.2	25.5	14.7	18.861.2	1	13	4	16	74.6	31.1	6.5	.67	21	11	44	W.	10	W.	7,533																																																																																																																																																																																																																																																																																																																																																																																																															
Suma.....	287.559	287.702	287.941	287.847	7.950	423.4	623.6	480.9	510.8	709.4	937.0	718.54	100,411																																																																																																																																																																																																																																																																																																																																																																																																														
Means.....	23.988	23.975	23.996	23.987	24.440	16	23.241	110	.662	35.3	52.4	40.1	42.653.4	127	23	2	512	59.1	56.2	50.9																																																																																																																																																																																																																																																																																																																																																																																																														
																		

• October.

† March.

‡ June.

§ February.

CHEYENNE, WYO.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).				Number of days—																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.			Number of calms.	Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.											
												7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.			
1884.	10	6	3	0	2	7	17	48	0	9.4	12.9	9.7	11.0	63.2	53.5	64.5	60.4	1.7	3.6	2.1	2.6	3.1	2.9	3.6	0	0	0	0	0	0					
Jan.	9	5	1	0	7	6	15	34	1	8.8	12.2	10.4	10.5	65.4	50.9	62.5	58.6	2.9	4.8	3.4	3.5	3.2	4.1	3.8	0	0	0	0	0	0					
Feb.	18	7	3	6	13	6	14	32	0	16.1	15.1	16.8	16.0	68.3	42.5	62.0	57.6	2.4	4.1	2.6	2.6	2.3	3.0	2.7	0	0	0	0	0	0					
Mar.	19	9	2	6	12	3	10	27	2	21.2	22.2	25.0	22.8	71.9	48.8	69.3	61.3	4.8	6.0	4.4	4.4	3.6	4.4	3.1	0	0	0	0	0	0					
Apr.	16	10	7	7	6	7	14	24	2	32.8	31.5	34.3	32.9	72.0	38.8	60.9	57.2	4.8	6.4	4.4	4.4	3.6	4.4	3.1	0	0	0	0	0	0					
May	6	2	4	11	22	12	11	19	4	43.1	41.0	44.7	42.9	76.1	33.9	61.2	57.1	3.8	6.0	4.4	4.4	3.6	4.4	3.1	0	0	0	0	0	0					
June	3	5	3	7	13	11	37	2	39.2	26.8	41.4	35.8	59.6	20.0	49.5	43.0	2.0	3.7	2.6	2.6	2.3	2.6	2.0	1	0	0	0	0	0	0					
July	6	7	3	14	15	9	8	29	2	41.6	36.9	43.0	40.5	71.3	33.2	57.7	54.0	3.1	3.5	3.5	3.5	3.4	3.5	0	0	0	0	0	0	0					
Aug.	5	3	0	6	18	12	11	34	1	30.7	26.1	32.2	29.7	57.8	23.7	46.4	42.6	3.1	2.5	2.9	2.9	2.8	3.0	1	0	0	0	0	0	0					
Sept.	10	3	2	3	20	8	14	32	1	25.9	27.0	28.9	27.3	63.4	31.1	58.2	50.9	3.0	3.6	3.3	3.3	3.3	4.0	1	0	0	0	0	0	0					
Oct.	12	7	1	2	6	1	13	48	0	19.5	13.9	19.7	17.7	66.9	33.2	61.8	54.0	1.4	3.9	2.8	2.8	2.7	2.8	0	0	0	0	0	0	0					
Nov.	15	12	3	3	15	9	20	16	0	9.3	12.0	8.4	9.9	77.8	68.1	78.5	74.1	5.1	5.8	4.9	4.9	5.3	5.8	0	0	0	0	0	0	0					
Dec.	123	70	32	74	148	92	158	380	15	297.6	278.6	314.5	297.0	813.7	469.7	732.3	671.7	36.9	52.3	41.5	43.6	43.6	191	1	29	0	0	0	0	0					
Sums ..											Percentages.																								
Means.	11.2	6.9	2.9	6.7	13.5	8.4	14.4	34.6	1.4	24.8	23.2	26.2	24.7	67.8	39.1	61.0	56.0	3.1	4.4	3.5	3.7	3.7	62.2	0.37	9.9	0	0	0	0	0	0				

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 5.09 a. m., 1.09 p. m., and 9.09 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11.03 p. m., December 31, 1884, inclusive, .000 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 6.270; February, 6.270; March, 6.200; April, 6.020; May, 5.890; June, 5.760; July, 5.710; August, 5.720; September, 5.890; October, 6.040; November, 6.230; December, 6.300.

EDGAR MCGOVERN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHICAGO, ILL.

Location of office on December 31, 1884, Major Block, corner of Madison and La Salle streets.

[Latitude, 41° 52' N.; longitude, 87° 39' W. Elevation of barometer above sea-level, 661 feet. Elevation of exposed thermometer above ground, 70 feet. Elevation of rain-gauge above ground, 93 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.							Precipitation.			Wind.			Total movement.	
	Washington time.			Monthly mean.			Washington time.				Self-registering thermometers.			Any consecutive 8-hourly measurements.			Maximum hourly velocity during month.			Prevailing direction.					
	7 a. m.	3 p. m.	11 p. m.	In.	Th.	Lowest.	Date.	Range.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Last 8 days amount.	Date.		Miles.	Direction.			
1884.	In.	In.	In.	In.	In.	In.	In.	In.	°	°	°	°	°	°	°	°	°	In.	In.	°	°	°	Miles.		
Jan.	29.407	29.401	29.423	29.410	29.926	28.759	13	1.167	16.6	23.0	17.9	19.2	40.3	30	18.5	24.5	11.1	1.39	39	1-2	26	W.	30	W.	6.713
Feb.	29.304	29.280	29.298	29.294	29.758	28.702	19	1.056	24.8	30.5	27.7	27.5	59.2	19	2.8	35.4	20.3	3.27	13	12	28	N.W.	19	N.W.	5.412
Mar.	29.307	29.280	29.294	29.294	29.759	28.642	25	1.067	30.5	38.0	34.1	34.1	59.2	27	4	40.1	27.8	5.163	20	25	28	SW.	11	N.	6.168
Apr.	29.236	29.220	29.231	29.229	29.653	28.559	15	1.094	41.1	47.4	44.4	44.7	72.2	30	31.0	50.7	37.9	3.051	74	15	26	W.	27	N.	6.364
May	29.237	29.226	29.227	29.230	29.665	28.784	1	881	53.4	61.0	55.7	54.7	77.8	20	40.0	63.9	49.3	1.531	68	1	23	N.W.	27	N.	6.016
June	29.331	29.320	29.324	29.332	29.570	28.984	9	558	62.6	68.6	63.8	63.8	84.4	23	47.0	71.1	67.8	2.146	82	1-2	23	N.W.	9	N.	4.496
July	29.277	29.311	29.307	29.315	29.488	28.835	5	553	66.1	73.1	68.4	68.4	84.4	22	53.8	75.2	67.0	3.711	46	18	24	N.W.	23	N.E.	4.283
Aug.	29.310	29.318	29.318	29.325	29.633	28.835	9	630	65.5	73.3	68.5	68.5	91.2	19	51.1	74.9	61.7	2.501	27	23	24	SW.	17	S	4.986
Sept.	29.327	29.280	29.302	29.307	29.712	28.810	24	902	64.2	73.7	68.8	68.8	98.7	9	50.6	75.5	63.0	2.391	09	27	24	N.	8	SW.	5.800
Oct.	29.416	29.380	29.392	29.398	29.816	28.934	14	733	51.5	61.5	56.1	56.1	83.4	2	27.7	64.2	48.6	2.591	09	7	35	N.W.	23	SW.	5.745
Nov.	29.338	29.345	29.359	29.359	29.741	28.877	23	1,094	35.6	44.0	39.8	39.8	64.4	6	5.4	59.0	33.1	1.801	83	3	22	N.W.	23	SW.	5.441
Dec.	29.370	29.333	29.356	29.360	29.886	28.976	6	1,317	25.4	31.0	28.8	28.8	61.2	30	11.2	37.8	22.2	4.211	53	28	29	SW.	31	S	6.574
Sums	361.877	351.676	351.731	351.745	.....	.....	.....	711.128	594.3	625.1	572.5	578.4	.....	.....	.....	608.0	493.1	34.61	.....	.....	.....	.....	.....	.....	68,018
Means	29.323	29.302	29.311	29.312	29.926	28.850	15	1,927	44.7	52.1	47.8	48.2	50.2	19	18.5	50.7	41.0	.....	.....	.....	.....	.....	.....	.....	.....

* One 7 a. m. observation missed.

† See letter received, 485, observation, 1885.

January.

April.

August.

CHICAGO, ILL.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									
	North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.		Washington time.				Percentages.									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storm.	Aurora.	
1884.																														
Jan.....	6	4	2	3	9	28	31	10	0	9.0	13.9	8.6	10.5	71.5	87.3	66.9	68.6	9	13	9	9	13	18	26	0	0	0	0	0	
Feb.....	4	16	5	5	13	7	16	17	1	16.9	21.8	18.5	18.0	71.7	88.8	67.9	69.5	4	11	14	11	16	8	25	0	0	0	0	0	
Mar.....	19	12	10	5	13	7	12	13	2	22.7	24.0	24.5	24.4	72.5	82.7	67.9	67.6	4	11	16	11	16	9	15	0	0	0	0	0	
Apr.....	21	11	24	4	4	5	10	11	0	33.4	32.6	33.8	33.3	74.6	58.9	69.2	67.6	9	9	12	9	12	9	0	0	0	0	0	0	
May.....	24	7	10	9	16	17	6	4	0	43.9	44.8	44.5	44.4	71.9	57.1	69.2	67.6	9	9	12	9	12	9	0	0	0	0	0	0	
June.....	24	11	17	6	5	6	5	9	7	55.0	54.0	56.5	55.8	76.9	65.5	77.7	73.0	6	10	6	10	6	0	0	0	0	0	0	0	
July.....	13	13	15	4	11	10	13	13	1	58.2	53.1	59.0	58.4	76.2	61.0	72.6	69.9	9	12	8	12	8	0	0	0	0	0	0	0	
Aug.....	7	14	18	5	19	8	10	8	4	57.5	56.6	58.1	57.4	78.2	60.0	70.0	68.8	5	25	1	15	12	4	0	0	0	0	0	0	
Sept.....	7	8	14	4	22	21	13	2	0	54.7	56.6	58.8	57.4	77.4	60.0	71.1	69.3	4	11	6	14	9	0	0	0	0	0	0	0	
Oct.....	8	3	7	7	15	27	20	6	0	44.6	48.7	46.5	45.9	77.1	68.1	76.3	75.3	14	11	7	14	7	3	9	0	0	0	0	0	
Nov.....	9	8	5	5	10	23	17	17	1	30.4	33.7	33.2	32.1	81.6	68.1	76.3	75.3	9	14	7	9	18	10	20	0	0	0	0	0	
Dec.....	0	4	2	9	21	19	19	0	21.0	24.1	23.2	22.8	82.8	75.6	80.4	76.6	4	9	18	4	9	18	10	20	0	0	0	0	0	
Sums ..	142	106	128	66	161	178	171	129	16	449.3	470.8	464.2	461.8	911.4	759.0	858.5	842.9	106	123	106	138	47	100	1	20	0	0	0	0	0
Percentages.									70.4	59.0	63.2	70.2	5.0	4.2	5.2	29.0	41.9	28.0	36.9	12.8	27.3	36.5	0							
Means ..	12.9	9.7	11.7	6.0	14.7	16.2	15.6	11.7	1.5	37.4	39.2	38.7	38.4	76.0	63.2	71.5	70.2	5.9	12.8	27.3	36.5	0								

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 6.18 a. m., 2.18 p. m., and 10.18 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1 to 11 p. m., December 31, inclusive, —.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.750; February, 0.750; March, 0.740; April, 0.730; May, 0.700; June, 0.690; July, 0.690; August, 0.690; September, 0.690; October, 0.710; November, 0.710; December, 0.700.

REMARKS: Frequent halos during first ten days of January; heavy rain February 12; heavy rain March 25; heavy snow April 30, severe gale 27; severe frost May 29; heavy frost October 23 (first frost for season); thunder-storm November 16; cold spell December 16 to 27.

T. B. JENNINGS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHIMO, FORT, UNGAVA BAY, LABRADOR.

[Latitude, 59° N.; longitude, 68° W. Elevation of barometer above sea-level, 126 feet. Elevation of exposed thermometer above ground, — feet. Elevation of rain-gauge above ground, — feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.		Wind.			Total movement				
Month.	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	
	7 p. m.	3 p. m.	11 p. m.							7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.						Minimum.	Date.		Absolute range.
1884.	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>	<i>In.</i>				<i>In.</i>	°	°	°	°	°	°	°	°	<i>In.</i>	<i>In.</i>	Date.	Miles.	Direction	Miles.	
Jan.	29.778	29.761	29.785	29.775	30.593	27.38	44.0	4.2	153	23.5	19.6	23.8	22.3	317.0	10	50.0	22.67.0	15.5	31.9	78.64	10	N.	58	7,017
Feb.	29.801	29.843	29.878	29.861	30.533	8.28	881	20.1	672	19.3	13.1	18.5	17.0	30.0	20	35.0	(1) 65.0	8.7	28.7	70.17	20	SW.	58	10,241
Mar.	29.814	29.920	29.935	29.923	30.569	27.29	987	21.1	483	12.7	2.5	11.1	8.8	28.0	29	41.0	3.69.0	1.0	21.4	17.51	13	NW.	61	8,802
Apr.	30.055	30.067	30.093	30.072	30.567	29.29	650	27.1	917	17.9	23.5	15.7	19.0	52.0	20	13.0	12.65.0	28.7	7.2	84.89	17, 18	SW.	36	4,715
May	29.863	29.861	29.867	29.864	30.429	7.29	240	3.1	189	34.7	43.4	32.7	36.9	72.0	20	10.0	1.62.0	45.6	23.5	2.02.54	4	Gale.	.....	.....
June	29.713	29.701	29.704	29.706	30.216	1.13	29.212	24.1	040	40.7	46.6	38.7	42.0	74.0	17	25.0	4.54.0	50.2	31.3	5.46.91	11, 12	SW.	.....	.....
July	29.835	29.820	29.838	29.831	30.425	8.29	483	1.942		53.4	62.1	47.0	54.9	86.0	{14}	27.0	8.59.0	68.8	39.2	1.40.57	28, 29	SW.	.....	.....
Aug.	29.739	29.723	29.731	29.731	30.108	22.69	132	10.876		48.6	57.5	43.2	49.8	80.0	6	23.0	23.57.0	61.8	37.2	3.28.98	1	Storm.	.....	.....
Sept.																								.....
Oct.																								.....
Nov.																								.....
Dec.																								.....
Sum.																							
Means.																							

* For 25 days.

† For 24 days.

‡ 8, 10, 11, 12.

REPORT OF THE CHIEF SIGNAL OFFICER.

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CHIMO. FORT, UNGAVA, LABRADOR—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point		Relative humidity (per cent.).		Cloudbiness (in tenths).				Number of days—										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.	
1884.	4	5	3	0	33	23	2	1	22	23.5	19.6	23.8	22.3	100.0	100.0	100.0	100.0	100.0	14	10	7	8	31	31	0	0	34
Jan.	4	6	0	4	12	43	3	8	12	19.3	13.1	18.5	17.0	100.0	100.0	100.0	100.0	100.0	8	12	9	10	29	29	0	0	21
Feb.	4	8	0	3	27	19	7	15	18	12.7	2.5	11.1	8.8	100.0	100.0	100.0	100.0	100.0	8	14	9	12	31	31	0	0	36
Mar.	14	19	0	3	10	13	3	15	13	17.0	21.5	15.2	17.9	96.3	92.6	97.9	95.6	95.6	8	16	8	19	20	29	0	0	8
Apr.	31	16	6	1	8	9	8	12	2	27.8	34.5	26.9	29.7	76.8	71.9	79.5	76.1	76.1	7	8	19	10	20	29	0	0	1
May	9	18	4	4	5	92	23	2	0	32.2	35.5	32.4	33.4	74.0	66.9	79.5	73.5	73.5	7	5	24	21	0	17	0	0	1
June	30	12	5	11	13	10	2	7	2	42.9	48.2	37.9	43.0	69.7	60.8	73.1	67.6	67.6	8	6	17	8	0	18	0	0	13
July	7	5	3	3	7	15	14	17	0	38.6	41.6	36.1	38.8	69.7	57.3	73.8	67.9	67.9	0	9	15	10	0	3	0	0	4
Aug.																											
Sept.																											
Oct.																											
Nov.																											
Dec.																											
Sums.																											
										Percentages.					Percentages.					Percentages.							
Means.																											

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.35 a. m., 3.35 p. m., and 11.35 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., August 25, 1884, inclusive, —.002 inch.
Station closed August 25.

LUCIEN M. TURNER,
Observer, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CHINCOTEAGUE, VA.

Location of office on December 31, 1884, Front street, near town hall.

[Latitude, 37° 55' N.; longitude, 75° 29' W. Elevation of barometer above sea-level, 8 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 26 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																				
	Washington time.			Washington time.			Self-registering thermometer.			Monthly mean.	Highest.	Date.	Lowest.	Range.	Washington time.			Any 3 consecutive 8-hourly measurements.	Total amount.	Mean minimum.	Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																			
	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.						Minimum.	Date.	Absolute range.				Date.	Miles.			Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																	
1884.	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i>	<i>I_n</i> </

January.

April.

July.

CHINCOTEAGUE, V. A.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.					Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.	
										7 a. m.	3 p. m.	11 p. m.	Mean.															
1884.																												
Jan.....	23	12	1	4	13	0	6	24	1	26.4	29.1	28.2	27.9	84.3	80.2	84.5	83.0	6.4	6.3	4.8	5.9	0	24	0	0	0		
Feb.....	11	10	12	6	18	17	0	18	0	37.0	38.5	37.8	38.1	90.1	83.6	89.1	87.6	5.4	6.1	4.8	5.9	0	10	0	0	0		
Mar.....	7	13	4	17	14	1	0	37	0	40.1	41.6	42.0	41.9	78.0	68.0	80.8	76.9	5.0	5.8	3.9	4.7	0	18	0	0	0		
Apr.....	11	10	10	12	3	11	1	31	0	53.5	53.2	53.0	53.0	81.5	68.1	86.8	77.7	4.7	4.8	3.2	4.3	0	6	0	0	0		
May.....	7	7	5	12	23	22	2	15	0	64.4	64.8	63.2	64.3	80.2	74.4	81.4	83.4	4.4	4.5	3.6	4.4	0	10	0	0	0		
June.....	1	13	11	15	28	14	3	7	0	66.0	66.8	68.3	67.3	87.7	71.7	91.7	85.7	4.2	4.8	3.5	4.6	0	6	0	0	0		
July.....	13	1	6	10	28	15	3	17	0	68.9	68.4	69.2	69.6	84.6	78.1	84.8	86.2	3.7	6.0	5.1	5.9	0	10	0	0	0		
Aug.....	6	21	9	20	8	21	3	4	1	65.0	61.3	63.9	64.4	87.0	67.0	83.6	79.2	2.8	3.1	2.0	2.5	0	1	8	0	0		
Sept.....	8	10	3	11	30	21	2	13	1	53.5	51.7	53.5	54.6	81.3	66.9	83.8	77.2	3.6	3.8	3.2	3.5	0	0	0	0	0		
Oct.....	21	9	5	13	21	6	2	22	0	40.6	42.4	42.2	41.7	84.7	68.2	80.8	77.9	2.9	3.1	2.7	3.2	0	0	0	0	0		
Nov.....	20	15	2	10	6	12	3	22	0	33.3	37.2	35.8	35.4	83.6	77.9	84.7	82.1	3.6	6.2	5.8	6.3	0	9	0	0	0		
Dec.....	23	19	2	7	5	16	5	13	1	33.3	37.2	35.8	35.4	83.6	77.9	84.7	82.1	3.6	6.2	5.8	6.3	0	4	0	0	0		
Sums ..	151	142	70	137	199	172	30	193	4	537.5	599.7	597.5	594.9	1,029.9	879.7	1,037.0	982.2	56.7	61.8	52.3	56.8	0	11	55	2	8	0	
	Percentages.																											
Means .	13.8	12.9	6.4	12.5	18.1	15.7	2.7	17.6	4.4	49.0	50.0	49.8	49.6	85.8	78.3	86.4	81.8	4.7	5.2	4.4	4.8	0	3.0	15.0	0.5	2.2	0	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.07 a. m., 3.07 p. m., and 11.07 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.013 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.010; February, 0.010; March, 0.010; April, 0.010; May, 0.010; June, 0.016; July, 0.010; August, 0.010; September, 0.010; October, 0.010; November, 0.010; December, 0.010.

REMARKS.—No remarkable meteorological phenomena occurred during the year. The elevation of station barometer was changed on the night of the 31st of May, after the 11 p. m. observations; authority, letter dated Office Chief Signal Officer, May 24, 1884.

CHAS. F. DICKENS,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CINCINNATI, OHIO.

Location of office on December 31, 1884, Pike's Opera House, West Fourth street.

[Latitude, 39° 8' N.; Longitude, 84° 30' W. Elevation of barometer above sea-level, 620 feet. Elevation of exposed thermometer above ground, 68 feet. Elevation of rain-gauge above ground, 76 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.										Precipitation.		Wind. #																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Month.	Washington time.				Monthly mean.				Washington time.				Self-registering thermometers.				Mean maximum.		Mean minimum.		Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	Miles.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	7 a. m.		3 p. m.		11 p. m.		Monthly mean.		Maximum.		Date.		Minimum.		Date.		Absolute range.		Total amount.		Largest amount.		Date.					Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.				In.	In.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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* 30 days. † One 11 p. m. observation taken late. ‡ All wind movement should be increased 40 per cent before using. (See 10138, Sig. 1885.)

Meteorological summary for the year ending December 31, 1884—Continued.

CLEVELAND, OHIO.

Location of office on December 31, 1884, National Bank Building, corner of Superior and Water streets.

[Latitude, 41° 30' N., longitude, 81° 42' W. Elevation of barometer above sea-level, 690 feet. Elevation of exposed thermometer above ground, 73 feet. Elevation of rain-gauge above ground, 73 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.								
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.	Prevailing direction.	Total amount.						
	7 a. m.	3 p. m.	11 p. m.							Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.			Total amount.	Largest amount.				Date.					
																								Direction.	Miles.			
1884.																												
Jan.	29.371	29.330	29.367	29.356	29.954	27	28.714	2	1.240	16.6	22.8	18.9	19.8	51.8	30	13.0	5	64.8	27.0	10.5	1.55	39	30	38	28	SW.	9.017	
Feb.	29.265	29.295	29.258	29.269	29.789	15	28.789	19	1.288	27.7	80.8	30.8	33.6	64.2	13	3.5	29	67.7	30.7	22.9	5.27	153	4.5	39	30	NE.	6.880	
Mar.	29.283	29.267	29.269	29.273	29.666	30	28.674	26	992	30.7	36.3	33.9	33.6	64.8	25	1.5	1	66.3	40.9	24.9	1.87	153	11, 12	33	30	W.	7.006	
Apr.	29.200	29.180	29.190	29.190	29.579	21	28.517	2	1.063	40.3	46.7	43.5	43.5	75.9	30	27.0	7	48.9	51.6	36.5	1.76	198	1.2	37	30	SW.	6.879	
May	29.225	29.197	29.212	29.211	29.587	19	28.819	19	748	54.7	63.2	56.2	57.7	83.8	22	38.0	29	45.8	66.4	59.3	2.60	193	19, 20	37	30	SW.	6.990	
June	29.245	29.208	29.212	29.222	29.638	15	28.926	9	712	65.8	72.5	67.3	68.5	84.3	24	51.1	15	32.9	78.5	59.8	2.29	252	9, 10	36	30	NE.	5.989	
July	29.185	29.167	29.168	29.173	29.892	31	28.907	31	453	65.8	72.5	68.8	68.5	84.3	23	53.7	8	32.6	75.7	61.6	5.13	225	26, 27	36	30	NE.	5.989	
Aug.	29.327	29.301	29.310	29.313	29.569	6	28.956	28	613	64.0	73.7	67.0	68.2	86.8	8	50.0	11	28.8	77.2	60.1	1.65	183	28, 29	34	30	SE.	5.573	
Sept.	29.359	29.330	29.344	29.344	29.714	14	28.924	24	600	62.0	72.9	66.0	67.7	84.4	4	27.8	24	53.1	78.4	56.9	8.70	128	28	40	30	SW.	5.218	
Oct.	29.412	29.384	29.393	29.393	29.748	23	28.930	8	728	51.8	60.3	55.1	55.7	84.4	4	12.8	24	53.6	63.7	31.4	1.97	50	23	35	30	SE.	7.006	
Nov.	29.323	29.302	29.336	29.321	29.687	23	28.732	23	905	35.9	42.9	37.5	38.8	67.9	1	12.8	24	53.6	67.3	31.4	1.59	51	23	35	30	SE.	7.994	
Dec.	29.359	29.331	29.367	29.362	29.679	22	28.605	6	1.274	37.9	33.0	29.1	30.0	61.7	30	4.6	19	68.9	37.4	22.6	1.83	33	11, 12	40	30	W.	9.586	
Sums	351.674	351.862	351.518	351.517	350.934	27	28.501	119	10,737	544.1	625.9	578.6	581.2	89.4	13	13.0	5	624.6	487.8	33.26	1.53	33	83	40	30	SE.	83,615	
Means	29.306	29.286	29.298	29.298	29.298				895	48.3	52.2	47.8	48.4	80.4	13	13.0	5	52.0	54.8	40.6

* January.

† February.

‡ September.

CLEVELAND, OHIO—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time. Number of times observed blowing from—								Number of calms.	Dew-point								Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Mean.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.							
										7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.										7 a. m.	8 p. m.	11 p. m.	Mean.			
1864.	12	19	9	4	22	22	18	5	0	12.0	16.9	13.6	12.6	81.0	76.9	7.2	7.8	8.5	6.9	18	29	0	0	0	0								
Jan.	11	19	2	11	11	7	15	11	0	24.3	25.2	24.4	25.8	81.1	78.9	8.4	8.0	7.2	7.9	7	24	0	0	0	0								
Feb.	10	18	6	8	13	10	13	0	0	26.2	27.1	27.2	26.6	77.3	77.1	6.6	6.9	6.1	6.5	4	15	9	0	0	0								
Mar.	11	24	4	18	1	8	10	18	1	32.6	33.0	33.4	32.9	75.1	61.3	5.9	5.5	4.8	5.4	0	6	0	0	1	0								
Apr.	14	11	4	11	19	16	7	4	0	45.1	45.7	44.8	45.7	70.9	57.7	5.6	5.5	4.7	4.3	7	11	12	8	0	0								
May	11	23	18	20	8	2	1	4	8	57.4	57.4	57.2	57.3	75.2	61.1	3.7	3.8	1.5	3.4	13	8	0	0	0	0								
June.	17	14	7	8	5	11	16	15	0	56.6	56.5	57.2	56.8	73.0	59.0	3.2	3.1	1.4	2.4	4	0	0	0	0	0								
July	13	9	18	17	15	8	7	11	0	53.2	57.8	58.1	57.0	67.8	66.6	4.9	4.1	2.2	3.4	11	0	0	0	0	0								
Aug.	12	5	4	19	26	10	8	6	0	54.6	55.5	55.1	55.1	75.5	69.5	3.0	4.2	2.2	3.1	2	0	0	0	0	0								
Sept.	10	5	9	9	26	11	15	8	0	43.9	44.7	44.7	44.4	76.2	58.7	4.0	4.6	4.4	3.7	13	14	3	11	0	0								
Oct.	10	2	9	9	26	12	15	10	0	31.1	33.5	31.3	32.0	83.5	71.0	6.7	6.8	5.6	6.2	10	15	6	0	0	0								
Nov.	10	2	6	12	26	12	15	10	0	84.9	84.9	84.9	84.9	78.4	83.6	7.2	7.6	7.6	7.4	18	12	1	16	0	0								
Dec.	8	3	6	23	16	15	23	4	0	23.8	25.6	24.6	24.7	75.0	83.6	81.2	7.5	7.4	6.9	22	10	23	0	0	0								
Sums	124	188	81	155	180	135	159	112	4	462.9	477.4	475.4	471.9	789.6	809.3	876.9	70.2	53.9	63.6	108	154	106	158	45	121	0	23	0					
Means	12	21.2	6	7.4	14.1	16.4	12.3	14.5	0.4	88.6	89.8	89.6	89.3	65.8	74.9	73.1	5.8	4.5	5.3	23.1	42.1	20.8	43.2	12.8	33.1	0.0	0	0					
Percentages.										73.1	5.6	5.8	63.6	87.2	7.2	7.6	7.5	63.6	108	154	106	158	45	121	0	23	0						

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.41 a. m., 2.41 p. m., and 10.41 p. m., local time.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.780; February, 0.780; March, 0.780; April, 0.760; May, 0.720; June, 0.730; July, 0.720; August, 0.720; September, 0.720; October, 0.740; November, 0.770; December, 0.790.

REMARKS.—Lake frozen January 3, 1884; lake frozen entire month of February. March, lake free from ice on 27th. First vessel of season arrived March 27. April, last snow of season on 8th; last frost of season in city April 19. May 29 frost reported by person living out of town; June, July, August, and September, very pleasant months: September 19 earthquake at 2.47 p. m.; duration about five seconds; October 16, first light frost of season; first snow of season, October 23 and first killing frost, October 24; November about normal in all respects; December, river frozen over on 1st; lake frozen 20th. Last vessel of season (Professor Schnoot, stone laden from the islands) arrived on 15th. Temperature about normal; precipitation below the average. Month cloudy and windy.

WILLIAM LINE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

COLUMBUS, OHIO.

Location of office on December 31, 1884, corner Broad and High streets.

[Latitude, 39° 59' N.; longitude, 82° 5' W. Elevation of barometer above sea-level, 905 feet. Elevation of exposed thermometer above ground, 33 feet. Elevation of rain-gauge above ground, 70 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	7 P. M.			11 P. M.		Range.	Date.	Lowest.	Highest.	Date.	Lowest.	Highest.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Latest amount.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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! Anemometer from March 3, from 3 to 7.45 a. m., about 40 miles lost. * Anemometer from December 13 and 21, about 50 miles lost.

* Anemometer from—record incomplete. * January.

* April.

* June.

* August.

* September.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Percentage.				On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.										
										Mean.				Percentage.																			
										7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.							7 a. m.	8 p. m.	11 p. m.	Mean.						
1884.	4	1	4	5	33	24	7	15	0	11.5	16.5	15.0	14.0	80.3	68.7	73.5	73.8	7.1	7.2	6.0	6.8	9	17	18	29	0	0	0	0	0	0		
Jan.....	7	9	7	16	11	19	8	10	0	37.5	30.7	30.4	33.5	79.5	70.6	73.0	73.0	6.7	7.8	6.9	6.8	3	15	11	2	13	0	0	0	0	0	0	
Feb.....	10	13	8	11	21	12	10	6	1	27.4	30.1	30.2	29.2	74.3	70.6	69.5	68.4	6.7	7.5	6.3	6.3	6	11	17	18	5	12	0	0	2	0	0	0
Mar.....	12	13	8	10	7	18	20	6	1	34.8	38.8	39.0	37.5	73.1	69.5	69.3	66.5	6.1	6.8	6.7	6.2	10	14	15	0	2	0	0	3	0	0	0	0
Apr.....	10	6	5	8	14	13	21	16	1	47.3	47.7	49.9	48.3	73.3	51.5	51.4	65.4	3.9	5.4	3.7	4.3	12	15	4	11	0	0	0	5	0	0	0	0
May.....	13	17	11	12	16	7	4	3	7	59.3	59.3	60.5	59.7	75.6	51.5	70.9	66.0	3.8	5.7	4.5	4.7	10	13	7	9	0	0	0	5	0	0	0	0
June.....	11	12	5	3	8	18	17	1	1	58.2	56.1	58.3	57.5	71.4	45.0	63.7	60.0	5.1	5.1	2.8	4.3	10	16	5	9	0	0	0	5	0	0	0	0
July.....	16	10	8	7	11	19	17	0	0	56.6	55.6	58.0	56.7	74.5	42.6	63.4	60.2	3.8	5.5	2.4	3.7	14	13	4	6	0	0	0	4	1	0	0	0
Aug.....	7	10	5	8	24	20	8	0	1	57.3	61.1	59.1	59.2	81.2	55.6	70.6	69.1	4.1	5.3	2.5	4.0	13	4	10	0	0	0	3	1	0	0	0	0
Sept.....	9	9	2	9	14	19	16	1	1	47.2	49.0	48.1	48.1	83.1	59.0	73.6	71.9	3.6	5.0	2.2	3.6	13	5	5	0	1	0	0	0	0	0	0	0
Oct.....	11	6	4	2	16	23	19	6	3	82.5	84.4	82.8	83.2	88.4	65.2	75.3	76.3	4.7	5.4	4.7	4.9	10	10	6	1	0	0	0	0	0	0	0	0
Nov.....	13	3	10	14	23	7	15	8	0	26.9	28.2	26.2	26.3	87.5	76.5	82.1	82.0	3.1	7.6	6.6	7.4	4	10	17	14	7	23	0	0	0	0	0	0
Dec.....	13	108	73	97	188	204	168	123	15	495.6	506.5	507.5	499.7	942.2	704.7	866.3	837.6	64.7	73.8	53.4	63.9	104	147	115	140	82	89	12	17	3			
Sums ..	Percentages.																			Percentages.													
Means ..	11.2	9.8	6.6	8.8	17.1	18.6	15.9	11.2	1.4	40.5	42.2	42.3	41.7	78.5	53.7	72.2	69.8	5.4	6.2	4.4	5.3	28.4	40.2	31.4	35.3	8.7	24.3	3.3	3.4	6	0	0	0

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 6.38 a. m., 2.36 p. m., and 10.36 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1 to 11 p. m., December 31, 1884, inclusive, —.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.900; February, 0.900; March, 0.890; April, 0.870; May, 0.840; June, 0.840; July, 0.830; August, 0.830; September, 0.830; October, 0.860; November, 0.860; December, 0.910.

REMARKS.—Date of last frost in spring, May 30, 1884; date of first frost in fall, October 15, 1884; date of first killing frost in fall, November 7, 1884. Summer months very dry. Earthquake at 2.42 p. m., local time, September 19, 1884.

F. T. WILLIAMS,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

CONCHO, FORT, TEX.

Location of office on December 31, 1884, Post Quarters.

[Latitude, 31° 29' N.; longitude, 100° 24' W. Elevation of barometer above sea-level, 1,000 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.					Monthly mean.					Range.	Date.	Lowest.	Highest.	Self-registering thermometers.					Any 3 consecutive 3-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Washington time.			Monthly mean.		Washington time.			Monthly mean.						Date.		Minimum.		Date.		Absolute range.		Mean maximum.		Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	7 P. M.	3 P. M.	11 P. M.	7 P. M.	3 P. M.	11 P. M.	Maximum.	Date.	Minimum.	Date.					Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.		Date.	Miles.	Direction from—		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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January.

March.

July.

7,188

7,121

8,468

7,032

5,064

8,900

6,170

5,876

8,481

5,229

7,188

70,580

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COMOHO, FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—						Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																							
	North.	Northeast.	Southeast.	South.	Southwest.	Northwest.	Number of calm.			7 a. m.		8 p. m.		11 p. m.		Mean.		Clear.		Cloudy.		On which .01 inch or more precipitation fell.		Maximum below 33°.		Minimum below 33°.		Maximum above 30°.		Thunder-storms.	Aurora.																					
							North.	North-east.	South.	South-west.	West.	North-west.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 30°.																										
1894.																																																				
Jan.	6	12	1	5	17	3	12	33.3	29.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	22.6	13	10	8	9	4	4	4	4	4	4	4	0	0																				
Feb.	9	17	4	2	18	13	3	33.2	30.3	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	12	14	11	9	4	4	4	4	4	4	4	0	0																				
Mar.	1	15	10	5	30	7	10	39.3	37.3	33.7	33.7	33.7	33.7	33.7	33.7	33.7	33.7	33.7	33.7	4	4	3	10	4	4	4	4	4	4	4	4	0	0																			
Apr.	6	21	9	4	16	9	3	43.0	41.5	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	38.7	13	14	9	10	4	4	4	4	4	4	4	4	0	0																			
May	7	15	16	11	19	11	3	55.9	54.1	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	13	14	18	16	4	4	4	4	4	4	4	4	0	0																			
June	2	7	22	18	5	2	3	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	10	14	16	16	4	4	4	4	4	4	4	4	0	0																			
July	1	6	12	16	50	4	2	65.1	60.6	60.6	60.6	60.6	60.6	60.6	60.6	60.6	60.6	60.6	60.6	14	14	18	16	4	4	4	4	4	4	4	4	0	0																			
Aug.	0	15	17	16	34	5	10	62.4	58.5	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	20	14	16	16	4	4	4	4	4	4	4	4	0	0																			
Sept.	1	8	7	13	47	2	8	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5	64.5	25	14	12	12	4	4	4	4	4	4	4	4	0	0																			
Oct.	6	18	4	16	29	4	13	63.4	64.5	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	23	14	11	12	4	4	4	4	4	4	4	4	0	0																			
Nov.	8	18	5	4	25	13	18	41.8	46.8	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	13	11	9	9	4	4	4	4	4	4	4	4	0	0																			
Dec.	9	22	9	4	6	19	15	30.5	32.7	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	13	10	8	9	4	4	4	4	4	4	4	4	4	0	0																			
Sums	58	164	116	118	313	104	79	590.4	593.8	592.5	593.8	592.5	593.8	592.5	593.8	593.8	592.5	593.8	593.8	169	135	63	77	7	4	4	4	4	4	4	4	4	0	0																		
Percentages.																																																				
Means.						5.314	9.10	6.10	7.28	5.9	5	7.7	5.6	7.2							2.345	26.9	16.9	31.0	1.5	14	5.28	2.12	2																							

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 5.27 a. m., 1.27 p. m., and 9.27 p. m., local time. Correction for instrumental error of barometer used: From 5.27 a. m., January 1, to 9.27 p. m., December 31, 1884, both inclusive, +.003 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.020; February, 2.020; March, 1.970; April, 1.940; May, 1.900; June, 1.870; July, 1.880; August, 1.880; September, 1.900; October, 1.950; November, 2.010; December, 2.030.

V. M. KING,
Private, Signal Corps, U. S. A.

Metereological summary for the year ending December 31, 1894—Continued.

CUSTER, FORT, MONT.

Location of office on December 31, 1894, Post Quarters.

[Latitude, 45° 42' N.; longitude, 107° 34' W. Elevation of barometer above sea-level, 3,040 (B) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 31 feet.]

Month.	Barometer readings (corrected for temperature and instrumental errors only).						Temperature.						Precipitation.				Wind.			
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Total amount.		Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	
	7 P. M.	3 P. M.	11 P. M.	7 P. M.	3 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Direction from—	Date.	Miles.
1894.																				
Jan.	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806	24.806
Feb.	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808
Mar.	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808
Apr.	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808
May	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808
June	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808
July	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808
Aug.	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808
Sept.	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808
Oct.	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808
Nov.	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808
Dec.	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808
Sums.	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840	321.840
Means.	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808	24.808

* January.

† February.

‡ August.

§ December.

CUSTER, FORT, MONT.—Continued.

[illegible]

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 4.58 a. m., 12.56 p. m., and 8.58 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + 0.17 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.88; April, 3.180; May, 3.100; June, 3.060; July, 3.020; August, 3.000; September, 3.120; October, 3.240; November, 3.33; December, 3.400.

W. J. DAILEY,
Corporal, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DAVENPORT, IOWA

Location of office on December 31, 1884, First National Bank, corner Second and Main streets.

[Latitude, 41° 30' N.; longitude, 90° 20' W. Elevation of barometer above sea-level, 615 feet. Elevation of exposed thermometer above ground, 47 feet. Elevation of rain-gauge above ground, 77 feet.]

[illegible]

Meteorological summary for the year ending December 31, 1884—Continued.

DAVIS, FORT, TEX.

Location of office on December 31, 1884, Post Quarters.

[Latitude 30° 38' N.; longitude 103° 49' W. Elevation of barometer above sea-level, 4,928 (B) feet. Elevation of exposed thermometer above ground 6 feet. Elevation of rain-gauge above ground, 10 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.				Total movement.		
Washington time.			Monthly mean.			Washington time.				Self-registering thermometers.				Mean maximum.		Mean minimum.		Any sensitive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	
7 P. M.	9 P. M.	11 P. M.	In.	Th.	W.	Date.	Range.	Lowest.	Highest.	Date.	Lowest.	Highest.	Therm.	Therm.	Therm.	Therm.	Therm.	Therm.	Therm.	Therm.	Therm.			Therm.
1884.																								
Jan.	25.817	25.236	25.253	25.230	25.236	25.236	0.573	27.9	50.6	88.4	29.2	78.1	29.2	0	1	87.1	82.5	28.5	48.4	10.11	28	N.	N.	
Feb.	25.205	25.128	25.150	25.161	25.480	25.234	12.518	39.6	64.5	60.8	51.6	76.2	28	20	14	95.2	65.7	38.3	00	.....	24	N.E.	S.E.	
Mar.	25.120	25.069	25.080	25.086	25.378	25.234	6.623	42.6	66.8	64.1	54.5	77.1	28	30.1	18	47.0	67.7	41.9	28	23	30	S.W.	S.W.	
Apr.	25.166	25.106	25.111	25.128	25.370	25.184	8.666	28	514	44.8	67.4	54.7	55.5	37.0	21	53.1	68.5	42.8	1.63	2.3	32	S.W.	S.W.	
May	25.192	25.148	25.161	25.167	25.493	25.202	20	491	52.0	78.4	62.8	64.1	87.9	29	40.0	4.9	47.9	78.6	46.7	1.08	25	N.E.	S.W.	
June	25.223	25.194	25.205	25.211	25.388	25.205	6	279	62.5	88.4	70.1	72.0	97.0	25	52.0	8	45.0	87.4	60.3	2.78	19, 20	S.E.	S.W.	
July	25.224	25.208	25.212	25.218	25.399	19.25	125	18	174	68.9	91.7	77.7	73.4	101.0	11	12	88.5	20	40.5	95.2	97.4	35	N.E.	S.W.
Aug.	25.268	25.227	25.248	25.250	25.365	20.25	139	2	226	64.2	84.4	71.0	73.2	100.0	2	58.0	28	42.0	88.0	62.4	70.2	3	S.	S.W.
Sept.	25.240	25.208	25.222	25.228	25.383	20.25	104	29	822	60.3	79.1	68.5	69.2	88.0	6	7	48.0	28	33.0	82.4	59.1	23	N.E.	S.W.
Oct.	25.261	25.242	25.250	25.261	25.433	19.25	970	1	833	50.5	69.2	58.9	59.6	82.0	1	7	38.0	25	48.0	71.8	49.5	28	S.	N.E.
Nov.	25.264	25.256	25.272	25.277	25.439	19.24	963	21	529	38.6	61.2	59.8	59.2	78.0	1	2	27.0	20	24.0	68.0	37.4	10	S.W.	S.W.
Dec.	25.222	25.142	25.166	25.177	25.416	19.24	895	27	821	35.0	58.9	45.9	45.2	74.0	28	15.0	11	58.0	58.8	33.2	48	20	S.W.	S.W.
Sum.	302.720	302.164	302.840	302.439	.....	.....	.....	.....	.....	5.190	557.4	631.7	704.6	714.6	.....	.....	.....	538.8	580.5	523.56	.....	.....	.....	.....
Means.	25.225	25.180	25.196	25.202	25.356	20	715	16	430	48.9	71.0	58.7	59.6	101.0	6	0	.....	.....	.....	.....	.....	.....	.....	S.W.

July.

March.

January.

DAVIS FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time; Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Clearness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.								Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 80°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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NOTE.—7 a. m., 8 p. m., and 11 p. m. Washington time, correspond to 5.13 a. m., 1.12 p. m., and 9.12 p. m. local time. Correction for instrumental error of barometer used: From 5.13 a. m., January 1 to 5.12 a. m., December 30, inclusive, +.035 inch; from 1.12 p. m., December 30, to 9.12 p. m., December 31, 1884, inclusive, +.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.970; February, 4.950; March, 4.870; April, 4.780; May, 4.710; June, 4.680; July, 4.630; August, 4.640; September, 4.660; October, 4.840; November, 4.980; December, 4.980.

REMARKS.—Late killing frosts, April 31, 23; first killing frost, October 28. Office moved March 8, from outside the post to Government building north side of post, inside reservation. Former elevation of barometer 4,940 feet; thermometer 4,925 feet; present elevation of barometer 4,925 feet; thermometer 4,925 feet; rain-gauge 10.3 feet.

L. H. ALBRECHT
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

Location of office on December 31, 1884, Fourth street, head of Spring street.

DAYTON, WASH.

[Latitude, 40° 19' N.; longitude, 117° 59' W. Elevation of barometer above sea-level, 1,673 (B.) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.					Precipitation.				Wind.							
Month.	Washington time.			Monthly mean.			Washington time.				Self-registering thermometers.				Mean maximum.		Mean minimum.		Total amount.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		Total movement.			
	7 P. M.		11 P. M.	In.		Th.	Date.		Lowest.	Date.	Range.	7 A. M.		3 P. M.	11 P. M.	Monthly mean.		Maximum.		Date.	Minimum.	Absolte range.	Date.		Miles.	Direction from—		Date.		Miles.
	In.	Th.	In.	In.	Th.	In.	In.	Th.	In.	Th.	In.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.		Th.	In.	Th.
1884.																														
Jan.....	28.436	28.444	28.421	28.434	28.948	1.27	807	27.1	141	28.1	24.4	20.0	20.5	57.1	11	— 1.5	1	58.6	37.0	23.1	3.14	52	3, 4	24	SW.	7, 8, 12	SW.	3,001	Miles.	
Feb.....	28.293	28.306	28.283	28.295	28.810	26.27	504	17.1	306	20.4	30.9	23.1	24.8	58.0	24	— 21.5	12	79.5	33.7	14.9	3.66	1.00	17	28	SW.	18, 20	SW.	3,976		
Mar.....	28.175	28.181	28.158	28.171	28.485	20.27	539	9	946	33.5	47.2	33.9	39.9	63.9	18	21.6	7	42.7	50.0	31.7	1.70	1.00	9	10	24	SW.	10, 11	SW.	4,591	
Apr.....	28.188	28.190	28.164	28.181	28.510	19.27	813	10	697	41.9	60.4	49.9	56.7	77.9	8	32.5	27	45.4	64.6	49.8	2.40	.66	23	24	24	SW.	26	SW.	4,623	
May.....	28.246	28.242	28.207	28.232	28.491	29.27	913	20	878	48.6	71.0	59.5	59.7	87.3	31	35.5	12	51.8	75.1	45.3	.81	.87	8	20	SW.	3, 25	SW.	4,538		
June.....	28.200	28.184	28.166	28.183	28.431	17.27	978	11	465	54.8	73.8	64.0	64.0	97.5	18	33.0	27	59.5	78.8	52.1	2.02	.75	22	20	SW.	23	SW.	3,777		
July.....	28.260	28.260	28.232	28.242	28.491	8.28	017	5	474	54.6	75.0	64.8	64.8	93.5	25	44.0	13	51.5	80.4	51.6	.82	.10	22	18	SW.	2, 6, 16	SW.	4,834		
Aug.....	28.251	28.251	28.224	28.242	28.449	28.28	030	26	419	57.6	84.6	69.1	70.4	101.8	5	41.8	16	60.0	89.8	54.5	.69	.06	6	16	SW.	30, 31	SW.	4,820		
Sept.....	28.242	28.242	28.210	28.231	28.401	28.27	033	7	558	46.3	64.4	53.5	53.5	90.8	9	31.8	28	51.2	67.5	42.9	1.40	.45	3, 4	20	SW.	27	SW.	4,176		
Oct.....	28.293	28.319	28.305	28.307	28.655	10.27	827	12	898	44.4	59.2	48.9	54.8	73.7	12	28.8	7	44.9	62.3	40.4	3.45	1.47	11, 12	23	SW.	13	SW.	4,244		
Nov.....	28.423	28.413	28.417	28.423	28.669	28.136	21	580	33.4	46.0	38.7	40.9	64.0	25	23.5	22	40.5	48.0	32.2	.25	.10	10	8	24	SW.	26	SW.	2,213		
Dec.....	28.277	28.287	28.292	28.285	28.615	9.27	667	19	1,148	13.7	16.9	13.9	13.8	48.2	8	— 30.0	31	74.2	24.7	7.2	3.19	.74	17, 18	24	SW.	20	SW.	2,585		
Sums.....	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	330,280	44,173
Means.....	28.274	28.278	28.256	28.266	28.948	11.37	504	17.7	708	39.9	55.6	46.0	47.2	101.8	15	— 30.0	31	55.0	59.3	50.5	2.34	.43	4

1 January.

1 February.

1 August.

4 December.

DAYTON, WASH.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew point.				Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	B'ly.	Cloudy.	On which more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 90°.	Thunderstorms.	Aurora.		
1884.																																
Jan.....	13	5	5	3	1	29	21	8	23.6	26.5	25.3	0	0	85.0	75.3	87.9	82.7	4.4	4.6	4.9	4.6	8	15	8	12	9	26	14	24	0	0	0
Feb.....	8	11	4	5	3	38	13	7	15.9	19.0	18.2	0	0	83.6	64.0	85.3	77.6	5.5	5.7	5.7	5.6	10	10	13	16	14	24	0	0	0	0	0
Mar.....	11	13	7	9	12	27	9	3	22.0	33.7	32.7	0	0	82.6	62.3	78.8	74.6	5.5	5.7	5.7	5.6	15	10	10	14	0	0	0	0	0	0	0
Apr.....	8	13	19	5	5	26	13	0	35.0	33.5	35.5	0	0	77.8	47.8	67.0	64.2	3.9	4.2	4.2	4.2	16	10	5	14	0	0	0	0	0	0	0
May.....	2	20	3	17	3	40	0	2	38.6	44.8	43.9	0	0	69.5	40.5	57.4	55.8	2.7	3.7	3.7	3.7	23	15	3	4	0	0	0	0	0	0	0
June.....	7	5	7	12	10	36	9	2	46.9	49.8	50.9	0	0	77.1	44.3	57.4	55.8	5.8	5.5	5.4	5.5	16	8	6	16	0	0	0	0	0	0	0
July.....	4	2	6	10	15	41	8	0	45.2	47.5	46.6	0	0	73.7	39.6	58.1	54.9	4.0	4.4	4.3	4.4	13	12	6	6	0	0	0	0	0	0	0
Aug.....	6	5	11	13	7	39	8	4	43.2	43.6	43.3	0	0	73.8	38.4	58.1	54.9	1.6	1.5	1.3	1.5	25	15	2	2	0	0	0	0	0	0	0
Sept.....	8	6	8	13	4	27	5	2	38.9	41.0	40.0	0	0	83.7	54.0	74.8	61.4	4.7	4.8	4.4	4.4	14	7	10	7	0	0	0	0	0	0	0
Oct.....	6	7	5	12	6	45	7	1	37.7	42.9	38.4	0	0	83.7	73.0	92.5	87.1	2.6	2.6	2.6	2.6	13	11	8	14	0	0	0	0	0	0	0
Nov.....	12	15	8	2	4	28	10	3	33.7	37.3	36.3	0	0	83.7	74.3	84.0	82.5	7.5	7.8	6.5	6.5	14	10	6	6	0	0	0	0	0	0	0
Dec.....	7	12	1	3	3	36	9	0	31.0	12.5	9.1	0	0	86.1	74.3	84.0	82.5	7.5	7.8	6.5	6.5	5	9	17	20	20	21	29	11	0	0	0
Sums ..	84	113	75	104	73	432	112	36	890.4	483.2	424.2	419.8	946.7	648.6	845.6	813.7	51.6	60.6	40.9	54.0	4.3	4.5	138	136	92	180	44	110	22	12	12	4
Means ..	Percentages.																															
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NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 4.16 a. m., 12.16 p. m., and 8.16 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.013 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.81; February, 1.82; March, 1.82; April, 1.76; May, 1.76; June, 1.73; July, 1.72; August, 1.72; September, 1.73; October, 1.79; November, 1.79; December, 1.84.

H. S. BLANDFORD,
Private, Signal Corps, U. S. A.

DEADWOOD, DAK.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time; Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			Washington time.					Clear.	Rain.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.
									7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.									
1884.																									
Jan.....	11	8	2	2	17	35	6	9	4	13.9	16.3	14.0	14.4	83.1	68.1	75.2	75.5	4.1	4.1	4.1	6	15	15	30	0
Feb.....	6	21	0	1	4	28	8	2	6	12.9	13.4	8.3	9.0	80.3	71.1	80.7	77.4	2.9	4.4	4.4	6	17	16	26	0
Mar.....	2	20	26	8	4	9	14	4	5	18.1	23.9	20.8	20.9	81.8	69.5	79.8	77.0	5.1	5.5	5.5	11	16	18	26	0
Apr.....	10	14	10	20	17	10	4	4	1	26.8	30.8	29.0	28.5	82.5	67.3	76.9	75.6	5.2	4.5	4.5	10	16	1	18	0
May.....	8	25	6	13	10	17	9	3	0	36.5	38.3	32.9	33.2	78.5	54.9	71.8	68.4	2.7	2.7	2.7	8	11	0	2	0
June.....	10	21	2	12	21	18	3	8	0	49.5	51.1	52.4	51.0	78.3	51.9	70.8	67.0	2.7	3.4	3.4	15	11	0	0	0
July.....	11	26	9	6	14	15	5	0	3	43.9	52.5	51.4	50.9	79.5	55.0	71.1	68.5	3.9	3.9	3.9	14	0	0	0	0
Aug.....	1	26	9	6	14	18	8	2	9	46.5	48.5	49.1	48.0	76.1	49.0	68.7	64.6	2.3	2.5	2.5	3	0	0	1	0
Sept.....	5	13	4	2	13	21	11	2	14	37.8	38.6	39.5	38.6	73.5	47.3	64.7	62.2	2.7	2.4	2.4	4	0	0	0	0
Oct.....	2	17	5	4	8	26	3	2	8	31.1	32.7	31.6	31.8	62.5	42.0	57.4	54.0	2.5	2.9	2.9	10	5	1	1	0
Nov.....	2	27	11	5	4	8	26	3	2	21.0	22.6	21.4	22.0	66.0	48.0	60.8	58.3	2.0	2.7	2.7	9	4	8	3	0
Dec.....	2	27	10	4	2	26	7	1	13	2.0	5.9	4.4	4.1	78.9	64.4	75.2	73.3	4.8	5.1	5.1	17	20	27	15	0
Sums....	69	250	98	85	132	260	84	32	88	336.4	375.6	390.8	357.4	920.0	638.5	855.1	821.3	43.9	50.3	41.8	67	153	63	153	1
Percentages.																									
6.332.8 8.9 7.712.023.7 7.7 3.9 8.0 42.1 38.6 18.3 41.8 17.2 41.8 .33.8 .3																									
Means .																									

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 5.13 a. m., 1.13 p. m., and 8.13 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, +.015.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.96; February, 4.92; March, 4.84; April, 4.69; May, 4.53; June, 4.44; July, 4.43; August, 4.44; September, 4.56; October, 4.68; November, 4.84; December, 4.99.

GEORGE KINGSBURY,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DELAWARE BREAKWATER, DEL.

Location of office on December 31, 1884, northwest end Delaware Breakwater.

[Latitude, 39° 49' N.; longitude, 75° 10' W. Elevation of barometer above sea-level, 20 feet. Elevation of exposed thermometer above ground, 13 feet. Elevation of rain-gauge above ground, 36 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.								
Month.	Washington time.			Monthly mean.	Highest.		Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.				Total amount.	Any consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.								
	7 p. m.	3 p. m.	11 p. m.		Maximum.	Date.				Minimum.	Date.	Δ absolute range.	Mean maximum.	Mean minimum.	Date.	Miles.			Direction.	Date.										
1884.																														
Jan.	30.137	30.109	30.126	30.131	30.859	27	24	230	1.629	28.9	33.4	31.1	31.1	33.0	2	3.0	7	44.0	37.5	25.1	4.19	1.02	8, 9	52	SW.	13	NW.	14, 214		
Feb.	30.068	30.045	30.069	30.071	30.727	16	23	183	28	1.564	38.4	42.2	38.2	39.9	63.5	5	15.0	29	43.5	45.9	33.0	4.14	1.72	23	68	NW.	20	NE.	11, 847	
Mar.	30.086	30.079	30.031	30.015	30.471	16	29	483	26	.988	37.8	42.8	39.6	40.1	62.4	12	15.3	1	47.1	47.0	34.6	6.71	1.79	23	56	NW.	30	NW.	12, 976	
Apr.	30.832	30.829	30.873	30.861	30.217	12	23	184	2	1.083	44.9	50.5	48.2	47.2	70.0	16	35.0	6	35.0	53.0	42.1	1.82	.73	25	53	SW.	9	NW.	11, 484	
May	30.962	30.928	30.956	30.949	30.831	3	29	612	11	.719	58.2	63.7	58.0	60.0	81.8	2	45.5	30	35.8	66.6	53.7	.88	.48	7	40	NE.	20	SW.	10, 806	
June	30.067	30.042	30.046	30.052	30.453	15	29	697	26	.765	65.3	70.6	65.5	67.1	84.1	21	53.3	1	31.8	73.5	61.5	1.37	.52	11, 12	56	NE.	26	NE.	11, 541	
July	30.862	30.834	30.861	30.859	30.042	22	29	618	29	.424	69.4	76.7	70.8	72.3	88.3	24	60.5	17	37.8	73.8	65.9	2.12	1.00	29	46	W.	24	SW.	10, 543	
Aug.	30.046	30.020	30.036	30.034	30.390	23	29	693	30	.597	70.7	76.2	70.8	72.6	91.0	20	65.6	13	26.8	73.4	64.1	4.19	2.48	49	48	SW.	23	NE.	9, 193	
Sept.	30.124	30.074	30.102	30.100	30.431	14	23	737	17	.894	67.8	75.5	69.0	70.6	88.3	9	55.2	23	32.2	73.4	64.9	.99	.90	12	58	NE.	14	SW.	10, 697	
Oct.	30.161	30.102	30.137	30.135	30.804	26	28	744	8	.880	57.9	63.9	54.5	56.4	71.0	6	94.5	16	48.5	67.9	54.7	1.12	.66	23	51	NE.	15	SW.	10, 697	
Nov.	30.104	30.064	30.073	30.077	30.446	22	29	394	28	1.062	44.4	52.6	46.9	48.0	69.4	2	28.0	25	41.4	54.8	41.5	2.42	.96	23, 29	54	SE.	23	SW.	11, 703	
Dec.	30.177	30.125	30.138	30.132	30.618	20	29	585	6	1.088	37.5	41.9	39.0	39.0	50.5	15	8.9	20	51.9	45.4	34.0	3.22	.84	6	51	SW.	6	SW.	13, 721	
Sums	300,695	300,141	300,493	300,434						621.7	692.0	634.	649.4							471.6	728.3	581.1	35.17							
Means	30.066	30.012	30.041	30.036	30.859	27	23	124	12	.931	51.8	57.7	52.9	54.	84.4	130	5.9	20	39.3	63.7	43.4								SW.	189, 499
																						1 August.		1 December.						
																						1 January.		1 April.						

January.

April.

August.

December.

DELAWARE BREAKWATER, DEL.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time; Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.			Percentage.					Clear.	Rain.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.	
										7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.										
1884.																											
Jan.	9	13	5	8	11	20	5	27	0	24.3	27.3	25.9	0	83.1	79.6	81.1	81.3	5.4	9	12	10	17	8	25	0	0	
Feb.	6	16	8	16	8	14	4	15	0	26.7	32.3	34.4	25.7	90.0	88.1	86.6	85.6	6.1	4	14	11	20	1	11	0	0	
Mar.	15	16	9	17	14	7	8	21	0	34.1	33.7	35.7	35.2	87.5	78.5	86.3	84.1	7.1	4	14	9	19	7	9	0	1	
Apr.	9	20	6	8	5	10	3	29	0	39.4	39.7	40.7	39.9	82.0	69.3	81.6	77.6	6.2	6	16	8	12	0	0	2	0	
May	8	10	4	12	20	23	1	10	0	50.4	50.8	51.1	51.1	80.9	63.2	76.5	74.9	4.2	15	12	4	6	0	0	0	0	
June	5	23	2	16	19	20	4	4	0	61.9	60.8	61.4	61.4	89.1	73.0	87.3	83.1	4.8	12	14	4	9	0	0	1	0	
July	14	9	2	9	17	24	10	8	0	64.3	63.5	65.1	64.3	84.5	68.1	86.8	78.1	4.6	10	16	5	11	0	0	1	0	
Aug.	10	22	4	19	18	17	0	3	0	67.4	66.0	66.7	66.7	89.5	72.2	87.0	82.9	4.8	9	14	8	7	0	0	1	0	
Sept.	12	13	8	8	17	37	4	6	0	62.8	62.2	62.4	62.5	86.0	61.7	78.5	76.4	1.9	21	8	1	2	0	0	1	0	
Oct.	10	16	8	6	12	26	4	16	0	51.4	50.6	51.3	51.1	81.1	60.3	76.2	72.5	3.2	15	14	2	7	0	0	0	0	
Nov.	6	18	3	4	4	24	7	24	0	39.0	40.8	39.9	39.9	82.5	66.4	78.1	75.6	3.6	15	8	7	6	0	3	0	0	
Dec.	19	12	2	4	7	4	8	17	0	33.6	33.7	34.0	34.4	86.4	76.9	88.1	88.1	6.0	4	16	11	12	3	9	0	0	
Sums	111	188	51	111	162	251	49	185	0	567.0	568.8	568.8	568.0	1,022.4	853.8	968.1	955.2	57.8	126	100	80	131	16	57	1	15	
Means	10.1	17.1	4.6	10.1	13.8	22.9	4.6	16.8	0	47.2	47.4	47.4	47.3	85.2	71.2	82.3	79.6	4.8	4.6	34.4	43.7	21.9	35.8	4.1	16.6	0.3	1
Percentages.																											

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 7.08 a. m., 3.08 p. m., and 11.08 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.020; February, 0.020; March, 0.020; April, 0.020; May, 0.020; June, 0.020; July, 0.020; August, 0.020; September, 0.020; October, 0.020; November, 0.020; December, 0.020.

REMARKS.—August 28, phosphorescence on bay; December 30, mirage.

CHAS. G. SHEARER.

Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DENVER, COLO.

Location of office on December 31, 1884, Tabor Block, Sixteenth and Larimer streets.

Latitude, 39° 45' N.; longitude, 105° W. Elevation of barometer above sea-level, 5,294 feet. Elevation of exposed thermometer above ground, 73 feet. Elevation of rain-gauge above ground, 86 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.					
Month.	Washington time.			Monthly mean.			Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Total amount.	Any 3 consecutive 8-hourly measurements.	Date.	Maximum hourly velocity during month.		Prevailing direction.				
	7 a. m.	3 p. m.	11 p. m.	Maximum.	Minimum.	Date.						Absolute range.	Mean maximum.	Mean minimum.													
															7 a. m.	3 p. m.	11 p. m.				Monthly mean.						
1884.	In.	In.	In.	In.	In.	In.	In.				In.	o	o	o	o	o	o	In.	In.			Miles.	Direction	Date.			
Jan	24.730	24.695	24.759	24.728	25.058	24.350	24.350	9	.708	24.7	38.5	31.2	31.5	59.0	12	2.0	1	61.0	43.4	20.0	.22	.13	14	34	W.	W.	27
Feb	24.599	24.576	24.614	24.596	24.933	23.939	24.933	18	.994	24.2	38.2	29.2	29.9	61.3	24	15.0	12	76.3	40.8	10.4	.86	.60	26	36	W.	W.	23
Mar	24.568	24.534	24.583	24.562	24.938	23.975	24.938	13	.963	32.7	45.2	39.0	39.0	61.1	4	10.9	7	50.2	49.5	28.9	.93	.37	10	17	W.	W.	27
Apr	24.651	24.633	24.676	24.653	25.030	24.265	25.030	19	.765	35.4	51.2	43.9	43.9	57.3	24	22.5	19	47.8	53.5	32.4	3.33	1.71	18	19	W.	W.	27
May	24.743	24.720	24.751	24.738	25.037	24.405	25.037	8	.632	46.1	61.7	55.1	54.3	60.5	9	28.0	1	52.5	65.5	43.0	4.01	1.60	15	16	W.	W.	23
June	24.795	24.770	24.803	24.789	24.984	24.504	24.984	18	.480	57.9	76.8	66.3	67.0	90.2	26	48.0	2	42.2	78.6	54.3	1.47	.01	14	30	W. & S.	W. & S.	22
July	24.812	24.761	24.788	24.787	24.989	24.632	24.989	9	.337	62.9	85.9	73.9	74.2	96.5	6	62.0	31	44.5	87.6	59.3	.65	.12	21	20	N.	N.	26
Aug	24.859	24.829	24.855	24.848	25.046	24.550	25.046	3	.496	58.6	77.2	68.3	68.0	92.2	1	51.0	20	41.2	79.8	50.0	1.71	.28	9	28	W.	W.	1
Sept.	24.744	24.692	24.718	24.718	25.006	24.364	25.006	19	.702	53.6	75.4	64.8	64.6	87.8	1	40.0	24	47.8	77.8	51.1	.13	.08	26	27	W.	W.	7
Oct	24.821	24.761	24.810	24.794	25.170	24.339	25.170	16	.831	45.4	66.1	55.1	55.5	80.8	6	26.0	27	54.8	68.7	41.9	.21	.16	7	32	W.	W.	19
Nov	24.827	24.783	24.835	24.815	25.054	24.422	25.054	5	.632	32.6	53.3	40.3	42.1	69.8	6	18.2	22	56.6	55.9	29.5	.19	.13	22	46	W.	W.	28
Dec.	24.601	24.563	24.615	24.598	24.967	24.057	24.967	10	.910	19.9	82.5	21.3	24.6	68.2	1	8.0	10	76.2	38.6	12.7	.76	.34	21	25	W.	W.	19
Means	24.750	24.697	24.767	24.754	25.031	24.364	25.031	11	.845	49.4	70.0	58.4	59.2	91.6	5	36.0	13	65.0	73.7	44.8	1.15	.07	15	15	W.	W.	20
Means	24.730	24.692	24.754	24.718	25.170	24.339	25.170	11	.704	41.2	58.3	49.0	49.5	91.6	5	36.0	13	65.0	73.7	44.8	1.15	.07	15	15	W.	W.	20

Oct. 7 a. m. observation misplaced.

Oct. 7 a. m. observation misplaced.

Feb. 7 a. m. observation misplaced.

Feb. 7 a. m. observation misplaced.

* One 7 a. m. observation missed.

October.

February.

July.

** Meteorological summary for the year ending December 31, 1884—Continued.*

DES MOINES, IOWA.

Location of office on December 31, 1884, 825 Walnut street.

[Latitude, 41° 35' N.; longitude, 93° 37' W. Elevation of barometer above sea-level, 849 feet. Elevation of exposed thermometer above ground, 35 feet. Elevation of rain-gauge above ground, 45 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8 hourly measurements.		Maximum hourly velocity during month.				Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	7 p. m.		3 p. m.		11 p. m.		Range.		Date.		7 a. m.		3 p. m.		11 p. m.		Monthly mean.		Maximum.		Date.		Minimum.		Date.			Absolute range.		Mean maximum.		Mean minimum.		Total amount.		Largest amount.		Date.		Miles.		Direction from—		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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July.

March.

* January.

DES MOINES, IOWA—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—						Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—										
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.			Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 82°.	Maximum above 90°.	Thunder-storms.	Aurora.	
								7 a. m.	8 p. m.	11 p. m.															
1884.																									
Jan.	35	3	4	2	11	12	13	12	1	1	13.3	6.4	*65.2	57.5	*67.1	63.3	3	14	8	9	16	29	0	0	0
Feb.	32	8	6	7	10	5	8	10	1	7.2	14.1	7.2	67.3	60.5	67.8	65.2	3	13	13	14	16	29	0	0	0
Mar.	20	18	8	13	9	12	4	6	5	21.2	28.8	70.3	61.2	68.2	67.1	4	4	11	16	16	7	15	0	0	0
Apr.	23	10	6	16	9	4	5	12	5	34.7	38.8	74.6	66.9	66.1	61.4	7	5	9	16	16	7	0	0	0	0
May	21	6	5	23	11	16	8	10	6	44.7	44.6	83.7	85.5	77.9	72.8	13	5	13	5	13	0	0	0	0	0
June	11	7	5	23	20	11	5	11	9	58.2	61.4	83.7	85.5	79.2	72.8	17	6	10	13	12	0	0	0	0	0
July	18	11	8	15	20	15	10	13	14	68.9	62.1	83.8	85.5	79.2	72.8	16	6	10	13	12	0	0	0	0	0
Aug.	11	2	8	15	20	15	10	13	14	87.1	58.3	84.4	85.5	77.9	72.8	14	10	7	16	10	0	0	0	0	0
Sept.	12	4	1	9	25	25	4	5	5	56.3	58.7	84.5	85.7	76.9	73.0	18	13	6	10	0	0	0	0	0	0
Oct.	10	8	4	23	19	24	5	14	7	43.8	46.0	81.1	85.2	76.6	71.0	13	12	6	10	0	0	0	0	0	0
Nov.	80	7	2	6	11	12	8	10	12	28.6	30.8	78.5	60.2	76.5	72.1	8	13	4	6	3	18	0	0	0	0
Dec.	34	16	0	8	11	9	4	10	2	9.6	12.7	75.3	67.7	75.0	72.7	2	12	16	14	18	28	0	0	0	0
Sums	257	100	53	120	167	148	73	107	73	420.6	457.4	920.6	883.8	876.7	828.8	62	94	124	145	60	125	9	41	0	0
Means	22.4	9.1	4.8	10.1	15.2	13.5	6.7	9.7	6.7	35.0	38.1	76.7	57.0	73.0	68.9	5.2	25.7	33.9	38.6	16.4	34.2	5.1	20.0	0	0

* Mean, thirty days.

NOTE.—7 a. m., 8 p. m., and 11 p. m. Washington time, correspond to 5.54 a. m., 1.54 p. m., and 9.54 p. m., local time.

Correction for instrumental error of barometer used: From 5.54 a. m., January 1, to 9.54 p. m., December 31, 1884, inclusive, +0.12 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.970; February, 0.970; March, 0.960; April, 0.960; May, 0.960; June, 0.960; July, 0.960; August, 0.960; September, 0.960; October, 0.960; November, 0.960; December, 0.960.

F. W. CONRAD
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DETROIT, MICH.

Location of office on December 31, 1884, Chamber of Commerce building, corner Jefferson avenue and Griswold street.

[Latitude, 42° 20' N.; longitude, 83° 3' W. Elevation of barometer above sea-level, 661 feet. Elevation of exposed thermometer above ground, 61 feet. Elevation of rain-gauge above ground, 71 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.		Miles.		
Month.	Washington time.			Monthly mean.	High est.		Low est.		Date.	Range.	Self-registering ther- mometers.						Any 3 con- secutive 8-hourly measure- ments.	Maximum hourly velocity during month.		Prevailing direction.		Total movement.	
	7 a. m.	3 p. m.	11 p. m.		Date.	Range.	Mean maximum.	Mean minimum.			Total amount.	Date.	Direction	From—	Miles.	Date.		Largest amount.	Direction				From—	Miles.
1884.																							
Jan	22.402	29.349	29.387	29.379	30.005	27	28.649	2	1.856	19.2	24.4	20.4	21.351.5	30	-6.0	5.57.5	27.9	13.1	2.08	.35	In.	SW.	7,719
Feb	29.331	29.298	29.291	29.307	29.832	10	28.555	19	1.277	28.2	33.7	30.0	30.064.3	19	-5.8	29.70.1	38.7	22.6	3.39	.55	In.	N.	6,737
Mar	29.320	29.293	29.296	29.303	29.724	30	28.646	26	1.076	31.9	30.8	35.0	35.062.0	23	3.0	2.59.0	42.4	27.5	2.10	.41	In.	N.	6,639
Apr	29.247	29.213	29.230	29.230	29.631	21	28.483	15	1.186	40.8	51.4	44.0	43.570.5	28	30.1	40.4	53.3	37.2	1.54	.41	In.	N.	5,882
May	29.248	29.209	29.227	29.228	29.624	29	28.638	19	1.780	54.8	61.8	57.6	58.981.1	21	33.9	29.43.2	68.3	49.5	2.38	.54	In.	N.	6,886
June	29.385	29.351	29.354	29.357	29.677	15	29.018	9	1.051	66.2	73.7	66.2	70.400.0	23	48.0	26.42.0	86.3	60.4	1.92	.81	In.	N.	5,182
July	29.226	29.184	29.196	29.202	29.425	21	28.932	31	1.473	64.2	76.3	69.0	69.888.8	1	51.2	8.37.6	79.3	60.5	3.70	1.35	In.	N.	5,878
Aug	29.354	29.313	29.321	29.329	29.650	9	28.912	29	1.708	64.0	75.7	68.4	69.490.0	18	46.0	9.44.0	78.3	60.0	1.55	.86	In.	N.	5,699
Sept	29.367	29.329	29.352	29.347	29.787	13	28.914	28	1.843	63.5	74.0	67.6	68.488.8	10	45.0	21.42.8	76.1	59.7	2.70	.67	In.	N.	5,945
Oct	29.434	29.387	29.397	29.405	29.806	14	29.039	8	1.777	51.9	61.0	55.4	56.385.0	3	27.8	24.57.2	65.0	47.2	1.90	.91	In.	N.	7,254
Nov	29.830	29.310	29.352	29.831	29.674	6	28.628	23	1.043	36.6	43.0	39.1	39.062.2	23	14.4	24.47.8	46.0	32.4	1.74	.68	In.	N.	7,492
Dec	29.838	29.841	29.372	29.357	29.890	26	28.567	6	1.833	27.7	33.2	30.7	30.506.0	6	-6.1	19.06.1	37.0	23.5	3.05	.63	In.	N.	8,601
Sums	302.002	311.571	351.776	351.783	.....	.....	.....	.....	11.624	518.2	655.6	587.0	506.3	.....	.....	.....	610.7	605.4	403.6	28.17	.....	.....	70,614
Means	29.334	29.298	29.315	29.316	30.005	27	28.495	15	.980	45.7	54.5	48.9	49.700.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

January.

April.

June.

August.

December.

DETROIT, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 50°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.36 a. m., 2.36 p. m., and 10.36 p. m., local time.

Correction for instrumental error of barometer used: From 6.36 a. m., January 1, to 10.36 p. m., December 31, 1884, inclusive, +.017 inch.

The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.760; February, 0.750; March, 0.750; April, 0.730; May, 0.700; June, 0.690; July, 0.690; August, 0.690; September, 0.690; October, 0.710; November, 0.700; December, 0.700.

REMARKS.—September 19, at 2.41 p. m., an earthquake was felt, lasting about five seconds; the duration of the shock, 1.6, while the building quivered, was twenty seconds.

No damage was reported in the city.

N. B. CONGER,

Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DODGE CITY, KANS.

Location of office on December 31, 1884, Hoover's Block.

[Latitude, 37° 45' N.; longitude, 100° 0' W. Elevation of barometer above sea-level, 2,517 feet. Elevation of exposed thermometer above ground, 16 feet. Elevation of rain-gauge above ground, 37 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement.						
	Washington time.					Monthly mean.					Self-registering thermometers.					Washington time.		Mean maximum.		Total amount.			Any consecutive 8-hourly measurements.			Maximum hourly velocity during month.		Prevailing direction.
	7 a. m.	3 p. m.	11 p. m.	Date.	Highest.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Largest amount.	Date.	Direction.		Miles.					
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.					
Jan.....	27.534	27.505	27.542	27.527	28.004	4	26.981	9	1.023	18.3	35.2	23.2	25.666.5	28	-11.0	24	77.5	37.4	11.4	.08	.07	15 44 SE.	26 { W. } { NW. }	9, 123				
Feb.....	27.407	27.374	27.404	27.395	27.697	25	26.710	18	.987	22.1	35.8	27.7	28.565.0	24	-5.0	14	70.0	39.4	16.6	.28	.12	7 44 SE.	18 { NW. }	9, 001				
Mar.....	27.327	27.271	27.301	27.300	27.763	14	26.851	10	1.202	33.1	51.8	40.5	41.876.0	10	0.0	8	70.0	55.0	29.8	1.91	.96	17 56 SW.	10 SE.	12, 316				
Apr.....	27.341	27.298	27.342	27.327	27.689	20	26.817	13	.872	40.4	59.6	47.4	49.186.0	25	28.0	21	64.0	62.5	87.1	1.07	.38	11, 12 64 SE.	28 NW.	11, 553				
May.....	27.396	27.373	27.393	27.377	27.726	8	26.942	4	.784	52.8	68.7	57.4	59.557.0	9	32.0	9	55.0	71.8	48.2	4.47	.70	16 52 W. E.	8 SE.	9, 423				
June.....	27.423	27.398	27.416	27.412	27.552	2	27.194	7	.358	65.0	79.1	69.5	71.292.5	30	52.0	9	40.5	82.2	60.7	7.67	2.04	17 36 SE.	6 SE.	7, 550				
July.....	27.378	27.360	27.362	27.367	27.579	20	27.182	4	.897	68.8	86.3	75.8	76.697.8	8	58.5	31	88.6	86.6	5.40	3.13	16 56 NE.	9 SE.	9, 795					
Aug.....	27.464	27.438	27.450	27.451	27.721	4	27.185	1	.596	64.3	80.5	70.9	71.904.0	28	53.0	4	89.0	82.2	62.2	4.82	2.42	9 42 SE.	1 SE.	8, 745				
Sept.....	27.381	27.341	27.360	27.354	27.732	20	27.063	23	.669	61.4	81.1	68.3	70.892.0	3	45.6	28	48.4	82.9	69.8	1.23	.23	4 52 SE.	5 SE.	11, 290				
Oct.....	27.496	27.470	27.486	27.488	27.779	28	27.217	1	.562	50.4	68.9	55.5	57.683.2	17	28.0	80	53.7	69.9	47.7	1.50	.79	1 48 SE.	1 SE.	10, 248				
Nov.....	27.498	27.465	27.509	27.491	27.792	4	27.037	21	.755	33.1	52.5	39.3	41.671.5	7	12.1	23	59.4	54.0	28.9	.83	.53	11 28 SE.	16 NW.	8, 358				
Dec.....	27.414	27.392	27.428	27.411	27.891	24	26.896	4	.995	15.4	27.5	21.0	21.97.2	2	-11.8	25	76.0	29.9	13.0	1.10	.38	15 29 SE.	26 NW.	8, 893				
Sums.	329.042	288.685	328.002	328.910	.....	.....	9.140	524.6	724.0	563.6	614.7	7	.....	.....	.....	683.8	755.3	848.1	90.36	.....	.....	.....	114, 415					
Means.	27.420	27.390	27.417	27.409	28.004	*4	26.561	110	.762	43.7	60.8	49.6	51.297.8	18	-11.8	25	57.0	62.9	40.2	.....	.....	.....	SE.					

* January.

† March.

‡ July.

§ December.

DODGE CITY, KANS.—Continued.

Month.	Winds at 7 a. m., 3 p. m., and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																	
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.			Washington time.			Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storm.	Aurora.								
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.										11 p. m.	Mean.						
1884.																																
Jan.....	10	4	2	12	8	12	22	23	1	10.9	13.7	14.5	13.0	73.3	47.0	70.2	63.5	1.8	3.9	1.6	2.4	2.4	18	12	1	2	11	29	0	0	0	
Feb.....	15	7	5	17	4	7	11	21	1	16.1	19.3	19.7	18.4	78.3	57.3	74.2	69.9	4.1	6.7	5.5	5.4	5.4	8	13	8	3	8	11	27	0	0	
Mar.....	4	13	9	26	7	5	11	17	1	24.8	27.4	29.3	26.2	72.3	43.7	60.4	58.9	3.4	5.2	2.6	3.7	3.7	15	12	4	6	2	20	0	1	0	
Apr.....	12	3	11	16	9	2	13	24	0	31.9	30.0	33.7	31.9	71.6	36.7	60.4	56.2	4.5	7.7	4.0	4.7	4.7	10	13	7	6	0	10	0	1	0	
May.....	14	2	15	24	8	3	13	14	0	45.7	46.2	48.5	46.8	79.5	48.5	72.6	66.9	6.3	7.7	4.0	5.7	5.7	4	18	9	19	0	0	0	5	0	
June.....	3	8	15	40	3	4	6	9	2	60.3	61.7	62.7	61.6	85.1	57.7	73.8	74.2	3.6	3.5	4.0	3.4	3.4	13	14	3	11	0	0	0	11	8	0
July.....	5	28	9	32	9	1	3	6	0	62.2	65.2	65.2	64.2	80.4	53.5	71.0	68.0	4.2	2.5	3.5	3.5	3.5	12	16	2	8	0	0	0	2	1	0
Aug.....	10	10	14	32	15	3	3	6	0	59.4	61.0	62.0	60.8	84.8	41.6	74.5	70.9	5.3	4.3	3.3	4.3	4.3	12	13	6	10	6	0	0	4	1	0
Sept.....	6	3	5	45	15	2	2	12	0	54.6	54.3	56.5	55.1	79.0	41.6	66.9	62.5	3.0	1.8	2.1	2.3	2.3	19	8	3	8	0	0	0	1	0	0
Oct.....	5	3	7	38	10	3	8	13	0	46.2	46.5	47.8	46.8	85.9	51.4	76.2	71.2	3.6	3.6	2.3	3.1	3.1	18	7	6	8	0	0	0	4	1	0
Nov.....	14	2	4	11	9	11	10	26	3	29.2	32.5	31.0	30.9	85.7	51.7	80.9	79.0	4.4	6.1	4.8	5.1	5.1	11	11	9	8	19	29	0	0	0	0
Dec.....	16	3	5	25	3	1	7	32	1	12.3	16.0	14.8	14.4	87.5	68.1	82.1	79.0	4.4	6.1	4.8	5.1	5.1	11	11	9	8	19	29	0	0	0	0
Sums.....	114	86	101	318	106	54	109	292	8	453.6	473.8	482.7	470.1	963.8	609.7	860.5	811.4	46.8	52.0	40.2	46.5	46.5	160	145	61	93	45	134	22	31	0	0
Percentages.																																
10.4 7.8 9.229 9.749 9.918 4.077 37.8 39.5 40.2 39.2 80.3 50.8 71.7 67.6 3.9 4.3 3.4 3.0 43.7 30.6 16.7 25.4 12.3 36.3 6.0 8.5 0 0 0 0 0 0 0																																
Means.....																																

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time correspond to 5.28 a. m., 1.28 p. m., and 9.28 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.022 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.75; February, 2.74; March, 2.73; April, 2.72; May, 2.71; June, 2.70; July, 2.69; August, 2.68; September, 2.67; October, 2.66; November, 2.65; December, 2.64.

Remarks.—Last killing frost, April 21; last light frost, May 2; first light frost, October 8; first killing frost, October 30.

J. E. LAMOUETTE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DUNQUH, IOWA.

Location of office on December 31, 1884, corner Sixth and Main streets.

[Latitude, 42° 30' N.; longitude, 90° 44' W. Elevation of barometer above sea-level, 665 feet. Elevation of exposed thermometer above ground, 32 feet. Elevation of rain-gauge above ground, 45 feet.]

Barometer readings (corrected for temperature and instrumental error only).																								
Month.	Washington time.				Monthly mean.	Washington time.				Self-registering thermometers.				Precipitation.		Wind.								
	7 p. m.		3 p. m.			11 p. m.		Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.	Prevailing direction.	Miles.				
	In.	11 p. m.	In.	11 p. m.		In.	11 p. m.														In.	11 p. m.		
1884.																								
Jan.....	29.451	29.420	29.444	29.438	29.401	29.401	29.387	13	1.064	9.4	18.5	14.3	14.1	44.0	13	23.8	5	67.8	23.0	4.5	.99	.44	4,278	
Feb.....	29.330	29.294	29.309	29.311	29.267	29.267	29.244	19	1.023	17.8	26.5	22.8	22.2	41.7	1	7.5	15	49.2	31.0	12.4	2.19	.44	4,452	
Mar.....	29.299	29.280	29.305	29.295	29.216	29.216	29.187	11	1.267	26.9	37.5	32.8	32.2	65.2	27	3.8	4	69.0	40.5	23.7	3.85	1.02	4,132	
Apr.....	29.252	29.213	29.234	29.233	29.177	29.177	29.148	15	1.129	41.7	55.4	48.2	48.4	81.0	30	27.0	8	54.0	59.1	37.7	2.77	.95	4,905	
May.....	29.250	29.214	29.214	29.226	29.087	29.087	29.058	18	.832	53.5	67.4	59.2	60.0	81.0	31	38.7	29	42.3	71.0	49.8	4.88	1.48	4,068	
June.....	29.335	29.301	29.312	29.312	29.570	29.570	29.541	14	.570	62.9	75.7	67.3	68.6	90.2	30	46.7	10	43.5	80.2	59.0	4.90	1.43	2,973	
July.....	29.243	29.211	29.218	29.201	29.501	29.501	29.472	14	.510	63.5	77.5	69.0	70.0	91.7	22	51.5	6	40.2	82.0	59.8	5.30	1.23	3,093	
Aug.....	29.335	29.304	29.302	29.314	29.668	29.668	29.639	14	.470	61.4	76.6	67.1	68.4	93.0	19	43.9	8	41.1	79.6	58.4	4.25	1.19	3,276	
Sept.....	29.268	29.250	29.267	29.272	29.673	29.673	29.644	14	.429	61.1	76.8	66.9	67.9	92.5	18	43.1	78.2	58.3	4.07	1.44	1.44	1.44	3,150	
Oct.....	29.404	29.357	29.374	29.374	29.678	29.678	29.649	5	.732	49.5	62.0	53.9	55.1	85.0	8	27.7	28	57.3	64.4	47.4	4.16	1.06	2,773	
Nov.....	29.382	29.358	29.370	29.370	29.784	29.784	29.755	6	.968	31.0	42.5	35.4	36.3	94.6	9	2.2	24	65.4	68.8	57.4	4.19	1.06	2,339	
Dec.....	29.392	29.374	29.373	29.360	29.978	29.978	29.949	25	1.330	16.5	24.2	21.1	21.5	34.3	3	17.1	10	70.4	29.2	13.7	4.06	1.34	2,071	
Sums	351.971	351.876	351.684	351.747	351.747	351.747	351.747	11	11.020	498.7	639.4	557.5	564.5	564.5	18	616.0	95.3	945.1	842.88	842.88	842.88	842.88	46,142	
Means.	29.331	29.296	29.306	29.312	29.278	29.278	29.249	11	.918	41.4	53.8	46.5	47.1	92.5	18	23.8	5	53.8	57.1	57.1	57.1	57.1	57.1	4,142

* Dec. mbar.

† March.

‡ September.

§ January.

DEBQUE, IOWA—Continued.

[illegible]

t17 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.05 a. m., 2.05 p. m., and 10.05 p. m., local time. Correction for instrumental error of barometer used: From 6.05 a. m., January 1, to 10.05 p. m., December 31, 1884, inclusive, +.000 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.700; May, 0.690; June, 0.680; July, 0.680; August, 0.680; September, 0.700; October, 0.720; November, 0.760; December, 0.770. A. W. BROWN

A. W. BROWNE, Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

DULUTH, MINN.

Location of office on December 31, 1884, Metropolitan Block.

[Latitude, 46° 48' N.; longitude, 82° 0' W. Elevation of barometer above sea-level, 672 feet. Elevation of exposed thermometer above ground, 60 feet. Elevation of rain-gauge above ground, 56 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.			Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
Month.	Washington time.			Monthly mean.			Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Any 3 consecutive 8-hourly measurements.	Largest amount.		Date.	Miles.	Direction from—	Maximum hourly velocity during month.	Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	7 p. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.						Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.									Mean maximum.	Mean minimum.	Total amount.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
1884.	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W.</i>	<i>W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• December.

† March.

‡ June.

DULUTH, MINN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.						Relative humidity (per-cent.).						Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		3 p. m.			11 p. m.			Mean.			7 a. m.			3 p. m.			11 p. m.			Mean.			Clear.	Fair.	Cloudy.	On more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6 a. m., 2 p. m., and 10 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.790; February, 0.790; March, 0.770; April, 0.750; May, 0.730; June, 0.710; July, 0.700; August, 0.700; September, 0.730; October, 0.740; November, 0.770; December, 0.800.

REMARKS.—Office moved December 1, 1884. Elevation of barometer lowered 13 feet; thermometer raised 3 feet. Authority, telegram and letter of November 3 and 4. K. R. BRACE.
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

EASTPORT, ME.

Location of office on December 31, 1884, United States Custom-House, northwest corner of Water and Washington streets.

{Latitude, 44° 54' N.; longitude, 66° 50' W. Elevation of barometer above sea-level, 61 feet. Elevation of exposed thermometer above ground, 38 feet. Elevation of rain gauge above ground, 58 feet.}

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement			
	Washington time.					Monthly mean.					Self-registering thermometers.					Any 8 consecutive hours in which amount.		Maximum hourly velocity during month.		Prevailing direction.					
	7 P. M.	3 P. M.	11 P. M.	In.	Th.	Highest.	Date.	Range.	7 A. M.	3 P. M.	11 P. M.	Monthly mean.	Maximum.	Date.	Range.	Mean maximum.	Mean minimum.	T. total amount.	Amount.		Date.		Direction from	Miles.	
1884.																									
Jan.....	30.010	29.964	29.937	29.977	30.078	30.078	29.906	2	1.772	14.6	0	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	SE.	9	SW.	9	9,137
Feb.....	30.032	29.937	29.937	29.937	30.032	30.032	29.937	29	2.037	22.3	27.6	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2	NE.	28	NE.	28	7,858
Mar.....	29.881	29.841	29.872	29.865	30.033	30.033	29.839	29	1.004	24.7	31.7	28.1	28.2	28.1	28.2	28.1	28.2	28.1	28.2	28.1	NE.	27	NE.	27	8,306
Apr.....	29.706	29.688	29.719	29.703	30.129	30.129	29.779	15	1.350	37.9	43.8	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	NE.	16	NE.	16	6,262
May.....	29.648	29.603	29.638	29.630	30.271	30.271	29.628	31	1.043	44.8	51.3	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	NE.	9	NE.	9	5,522
June.....	29.680	29.623	29.635	29.646	30.417	30.417	29.599	24	1.818	53.4	64.2	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	52.7	NE.	20	NE.	20	3,341
July.....	29.721	29.682	29.719	29.710	30.036	30.036	29.635	14	1.711	57.6	64.1	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	54.9	NE.	20	NE.	20	4,191
Aug.....	29.972	29.933	29.941	29.935	30.169	30.169	29.670	31	1.712	56.9	68.5	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	NW.	11	NW.	11	3,133
Sept.....	29.967	29.916	29.931	29.945	30.803	30.803	29.495	16	1.808	54.4	61.7	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	NE.	16	NE.	16	4,239
Oct.....	29.983	29.917	29.934	29.951	30.499	30.499	29.420	17	1.070	42.6	48.5	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	NE.	31	NW.	31	7,699
Nov.....	29.898	29.866	29.884	29.879	30.434	30.434	29.694	29	1.540	34.6	38.6	38.6	38.6	38.6	38.6	38.6	38.6	38.6	38.6	38.6	S.	25	NW.	24	7,283
Dec.....	30.001	29.978	29.971	29.983	30.712	30.712	29.207	7	1.505	24.2	28.2	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	S.E.	15	NW.	15	8,219
Suma	335.968	334.433	334.730	334.723	30.712	30.712	29.207	127	13.677	478.0	545.1	478.6	478.6	478.6	478.6	478.6	478.6	478.6	478.6	478.6	S.E.	21	S.	21	75,000
Means	29.916	29.871	29.894	29.894	30.712	30.712	29.647	29	1.165	39.4	45.5	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	S.	15	S.	15	.....

* One 11 p. m. observation taken late.

† December.

‡ February.

§ August.

EASTPORT, ME.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m.; Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																		
	Number of calms.								7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Auroras.
1884.	North	Northeast	East	Southeast	South	Southwest	West	Northwest	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Auroras.				
Jan.	17	6	5	2	9	21	9	17	7	18.1	12.4	12.4	11.0	75.0	70.6	78.9	74.8	6.5	6.2	5.9	8	7	16	17	18	30	0	0	1				
Feb.	12	16	3	6	9	8	7	16	6	22.0	19.4	19.5	79.8	79.8	81.8	80.5	6.1	7.4	7.4	7.0	3	12	14	21	15	27	0	0	1				
Mar.	14	11	8	3	11	9	6	26	15	18.7	23.4	21.4	21.2	77.8	72.2	75.8	75.8	6.7	7.8	6.1	5	10	12	15	11	23	0	0	1				
Apr.	10	24	11	2	6	3	5	9	22	33.2	35.4	33.5	34.0	83.6	74.6	84.3	80.8	6.2	7.1	6.0	6	12	16	12	0	5	0	0	1				
May.	9	9	7	2	19	5	9	22	38.5	39.1	38.8	38.8	79.8	67.2	84.2	77.1	6.6	6.2	4.8	5.9	8	13	11	17	0	0	0	0	0				
June.	10	7	2	0	27	9	1	7	47.2	49.7	47.2	48.0	74.0	61.6	82.3	72.9	4.4	4.7	3.5	4.2	4	14	9	6	0	0	0	0	0				
July.	9	6	1	4	33	7	11	15	52.8	54.7	51.8	53.1	84.8	75.2	89.6	83.2	5.5	4.7	4.0	5.6	5	19	7	18	0	0	0	0	0				
Aug.	5	8	4	1	41	2	4	7	54.7	58.8	53.9	55.1	86.4	72.8	87.9	82.4	8.1	5.1	2.0	3.4	4	14	5	12	0	0	0	0	0				
Sept.	4	9	3	2	13	10	10	16	40.0	49.7	49.1	49.3	82.1	66.0	85.6	78.2	5.1	4.4	4.0	4.5	9	14	6	12	0	8	0	1	7				
Oct.	18	4	3	4	24	16	5	26	36.9	37.9	37.0	37.3	77.5	69.2	77.0	74.2	5.1	5.3	5.3	5.9	8	12	11	12	0	0	0	0	0				
Nov.	7	2	4	0	14	16	15	23	28.6	30.4	29.8	29.6	78.5	72.8	78.1	76.5	5.6	6.4	5.7	5.9	9	14	13	14	11	23	0	0	0				
Dec.	18	4	6	4	11	14	10	19	18.7	21.0	21.9	20.5	78.2	74.4	83.0	78.9	6.9	6.0	6.0	6.2	5	13	13	14	11	23	0	0	0				
Sums ..	142	98	58	30	218	123	88	190	403.4	432.5	416.2	417.4	836.3	810.3	983.5	934.8	67.8	75.3	60.7	68.1	91	146	128	178	55	129	0	10	26				
P. percentages.																																	
Means .	12.9	8.9	5.3	2.8	19.9	11.2	8.0	14.6	33.6	36.0	34.7	34.8	80.0	71.4	82.4	77.9	5.6	6.3	5.1	5.7	24.9	40.0	35.1	48.6	15.0	35.2	0.4	4.8					

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.40 a. m., 3.40 p. m., and 11.40 p. m., local time.

Correction for instrumental error of barometer used: From 7.40 a. m., January 1, to 11.40 p. m., December 31, 1884, inclusive, + .005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.069; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

REMARKS.—January, remarkably brilliant sunsets on 5th, 6th, 25th, and 26th, snow from cloudless sky in early a. m. of 21st; February, most severe storm for two years occurred on 28th; March, heaviest snowfall of season occurred on 8th; April, first light and heavy frosts of season occurred on 12th and 23d, respectively; May, frost observed and ice formed one-eighth to one-fourth inch, thick on the 30th; June, remarkable for absence of fog; July, cold, foggy, disagreeable month; August, noted for unusual number of foggy days, there being eight days foggy against two for August, 1881; September, noted for absence of gales; October, first snow of season occurred on 14th, precipitation is 6.43 inches less than for October, 1881; November, rain-storm on 21st, 1.60 inches fell in four hours; December, an unusually large number of gales occurred, remarkable for extremes of pressure and temperature.

D. C. MURPHY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ELLIOTT, FORT, TEX.

Location of office on December 31, 1884, soldiers' barracks.

[Latitude, 32° 30' N.; longitude, 100° 21' W. Elevation of barometer above sea level, 2,650 (B) feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.*			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	Washington time.					Monthly mean.					Highest.		Date.		Lowest.		Range.		Washington time.			Self-registering thermometer.			Any 3 consecutive 8-hourly measurements.			Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	7 p. m.			3 p. m.		11 p. m.		Monthly mean.					Maximum.		Date.		Minimum.		Date.		Absolute range.			Mean maximum.		Mean minimum.		Total amount.		Last 8 days amount.		Date.		Miles.		Direction from—		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>		<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>	<i>In.</i>	<i>Bar.</i>	<i>Th.</i>

* Rain gauge overflowed. † Two 7 a. m., two 3 p. m., and two 11 p. m. observations missed. ‡ January. § March. ¶ August. †† December.

ELLIOTT, FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).	Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Number of calm.								7 a. m.			3 p. m.		11 p. m.		Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.											Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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* Two 7 a. m., two 8 p. m., two 11 p. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 5.27 a. m., 1.27 p. m., and 9.27 p. m. local time.

Correction for instrumental error of barometer used from 7 a. m., January 1, to 11 p. m., December 31, inclusive, +.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.930; February, 2.930; March, 2.830; April, 2.780; May, 2.700; June, 2.670; July, 2.640; August, 2.640; September, 2.600; October, 2.700; November, 2.830; December, 2.600.

J. C. RICKLI

Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1894—Continued.

EL PASO, TEX.

Location of office on December 31, 1894, corner San Antonio and El Paso streets.

[Latitude, 31° 47' N.; longitude, 106° 20' W. Elevation of barometer above sea-level, 3,764 (B) feet. Elevation of exposed thermometer above ground, 21 feet. Elevation of rain-gauge above ground, 34 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.						Precipitation.		Wind.							
Washington time.				Monthly mean.				Washington time.				Self-registering thermometer.				Total amount.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.							
7 p. m.		3 p. m.		11 p. m.		Monthly mean.		Maximum.		Date.		Minimum.		Date.		Absolute range.		Mean maximum.		Mean minimum.		Largest amount.		Date.		Miles.		Direction from—	
In.	Pa.	In.	Pa.	In.	Pa.	In.	Pa.	In.	Pa.	In.	Pa.	In.	Pa.	In.	Pa.	In.	Pa.	In.	Pa.	In.	Pa.	In.	Pa.	In.	Pa.	In.	Pa.	In.	Pa.
1894.																													
Jan.....	26.395	26.365	26.380	26.380	26.380	26.380	26.380	9	7.73	81.2	48.9	30.5	39.9	72.2	9	11.8	1	60.4	56.8	26.5	.58	16, 17	28	N.	1	W.	2,823		
Feb.....	26.270	26.228	26.251	26.253	26.248	26.248	26.248	12	6.13	42.0	59.0	50.9	50.6	78.8	25	22.2	14	56.6	64.4	39.5	.84	15, 16	28	N.	10	W.	2,158		
Mar.....	26.269	26.164	26.198	26.197	26.197	26.197	26.197	23	4.93	64.2	64.2	55.0	54.5	80.4	30	28.4	1	54.0	70.6	41.5	.83	19	22	N.	10	W.	2,981		
Apr.....	26.186	26.175	26.177	26.183	26.183	26.183	26.183	27	4.62	48.4	68.1	50.4	56.0	91.0	9	33.9	1	57.1	78.4	46.0	.91	14, 27	27	N.	19	W.	4,449		
May.....	26.225	26.198	26.190	26.204	26.204	26.204	26.204	20	5.86	56.7	81.0	60.3	60.0	102.8	31	39.5	3	63.3	91.0	54.5	(1)	19	21	W.	51	W.	2,498		
June.....	26.250	26.209	26.200	26.220	26.220	26.220	26.220	9	3.42	65.9	90.9	78.7	78.4	111.8	24	57.4	3	54.4	100.7	64.8	.11	10	14	N.	18	W.	8,116		
July.....	26.219	26.229	26.212	26.227	26.227	26.227	26.227	13	3.85	71.0	87.4	64.9	65.0	111.0	27	64.4	20	44.6	105.8	73.3	2.49	22	28	N.	30	W.	2,351		
Aug.....	26.268	26.255	26.256	26.256	26.256	26.256	26.256	4	3.68	41.9	83.7	64.9	79.6	110.2	1	63.0	23	46.9	98.4	69.5	2.49	23	23	N.	6	E.	1,474		
Sept.....	26.253	26.227	26.238	26.239	26.239	26.239	26.239	29	4.44	51.9	81.8	72.1	72.7	87.7	5	57.1	23	47.7	98.8	63.8	2.03	13	14	SW.	10	W.	1,566		
Oct.....	26.318	26.268	26.268	26.268	26.268	26.268	26.268	16	3.67	66.2	70.7	60.9	62.6	84.6	5	57.1	23	47.7	70.2	64.8	2.16	14	14	SW.	10	E.	1,539		
Nov.....	26.364	26.322	26.323	26.343	26.343	26.343	26.343	6	3.69	62.1	82.3	60.2	61.5	80.0	1	27.4	31	44.9	67.8	39.3	.23	18	22	W.	22	W.	1,609		
Dec.....	26.225	26.194	26.220	26.216	26.216	26.216	26.216	27	3.69	64.2	55.4	46.9	46.9	72.8	19	27.4	31	44.9	61.0	30.5	2.07	18	24	W.	21	W.	2,066		
Yr. Mean.....	26.251	26.214	26.215	26.215	26.215	26.215	26.215	18	4.18	63.4	80.4	62.3	62.3	111.8	24	57.4	31	44.9	67.8	39.3	.23	18	24	W.	.....	.....	.....	.....	.....
Sum.....	215.2	214.8	215.0	215.0	215.0	215.0	215.0	587	61.8	63.4	90.4	70.2	62.5	111.8	594	11.8	1	53.8	90.8	60.4	18.30	.....	.....	.....	.....	.....	.....	.....	.....
Mean.....	26.269	26.240	26.250	26.250	26.250	26.250	26.250	.....	515	63.0	72.4	62.2	62.5	111.8	.....	.....	1	53.8	78.9	50.7	.....	.....	.....	.....	.....	.....	.....	.....	.....

§ June.

§ December.

§ January.

§ Inappreciable.

* One 7 a. m. observation taken late.

EL PASO, TEX.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—						Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—				
	Number of calms.						Washington time.										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	
1884.																	
Jan....	0	5	11	6	1	1	15	15	22.2	23.4	26.1	24.0	71.6	42.8	61.6	58.7	3.2
Feb....	2	4	4	8	2	6	32	18	27.7	26.3	25.2	28.4	63.4	31.6	46.9	47.3	2.9
Mar....	4	2	1	3	0	8	38	14	29.6	27.6	24.2	24.4	55.2	21.4	33.9	36.8	2.9
Apr....	1	6	10	6	0	8	44	7	29.3	21.6	21.6	23.8	45.5	19.9	30.2	31.9	2.9
May....	1	6	6	7	0	11	37	13	31.4	26.1	28.2	28.6	41.3	14.8	23.9	26.7	2.7
June....	2	18	22	6	3	2	24	2	46.8	40.3	43.0	43.4	52.5	18.9	31.9	34.4	1.7
July....	6	10	13	6	7	7	16	8	54.2	49.6	52.6	52.1	51.1	20.8	34.9	35.6	2.2
Aug....	6	10	13	6	9	3	5	6	57.3	53.3	55.2	55.3	64.4	32.4	47.3	48.0	4.9
Sept....	1	14	16	9	1	7	22	6	53.0	52.4	53.3	52.9	60.8	39.0	47.8	48.0	5.4
Oct....	4	10	21	6	0	4	8	6	51.6	51.4	52.6	51.9	84.8	52.9	75.5	71.1	4.6
Nov....	3	14	17	6	2	4	12	11	36.0	35.3	37.1	36.1	79.5	38.2	62.3	60.0	4.3
Dec....	3	11	7	2	2	7	38	20	27.6	24.7	28.0	26.8	66.2	35.5	54.0	51.9	4.9
Sums...	28	104	138	62	22	73	292	123	463.7	426.3	453.1	447.7	745.3	368.2	529.1	557.6	43.6
Means.	2.6	9.5	12.6	5.7	2.0	6.7	25.1	12.3	33.6	33.5	37.8	37.3	62.1	30.7	45.6	46.5	3.3
	Percentages.												Clear.	Fair.	Cloudy.	On which precipitation fell.	Maximum below 32°.
													173	143	49	63	0
													47.4	39.2	13.4	17.2	0
													11,232	86.7	0	11,232	86.7

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.02 a. m., 1.02 p. m., and 9.02 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.040 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.88; February, 3.88; March, 3.80; April, 3.74; May, 3.64; June, 3.59; July, 3.60; August, 3.60; September, 3.65; October, 3.74; November, 3.85; December, 3.86.

REMARKS.—Rio Grande River frozen January 1; snow fell on January 10, 16, and 17; last frost of the season, February 9; disastrous floods in the Rio Grande River during May and June; violent whirlwind on May 27, damaging buildings; first light frost of the season, October 26; first heavy frost of the season, November 19; sun-glows observed November 12 and 13; snow fell December 11; unusually bright red sunsets December 17 and 18; sheet fell December 20 and 30.

FREDERICK BELFORD
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ERIE, PA.

Location of office on December 31, 1884, Fifth and State streets.

[Latitude, 42° 7' N.; longitude, 80° 5' W. Elevation of barometer above sea-level, 681 feet. Elevation of exposed thermometer above ground, 32 feet. Elevation of rain-gauge above ground, 59 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.		Wind.		Total movement.									
Washington time.					Monthly mean.					Washington time.		Self-registering thermometers.			Any 3 consecutive 8 hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.								
7 p. m.	3 p. m.	11 p. m.	In.	Th.	Highest.	Date.	Lowest.	Date.	Range.	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.			Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Direction from —	Miles.	Date.
1884.																												
Jan.....	29.373	29.329	29.319	29.354	30.015	27	28.674	21	1.341	18.3	23.3	20.5	20.7	48.5	30	—10.0	25	58.5	0	0	0	4.59	1.53	8, 9	SW.	14	2	7,376
Feb.....	29.296	29.281	29.285	29.287	29.635	19	28.514	19	31.7	30.0	30.1	63.0	19	—7.0	29	70.0	29	70.0	32.7	22.4	5.83	1.06	4, 5	SW. S.	52	219	7,238	
Mar.....	29.289	29.280	29.280	29.283	29.676	16	28.681	26	30.3	35.8	33.6	33.2	54.8	23	—1.0	1	505.3	541.8	25.9	3.84	1.17	20	53	S.	11	19	6,789	
Apr.....	29.210	29.181	29.185	29.192	29.632	21	28.472	21	40.1	45.0	41.7	42.3	76.0	27	26.9	7	49.1	50.2	35.2	1.90	0.65	2	53	S.	13	5	6,240	
May.....	29.217	29.194	29.212	29.203	29.555	8	28.851	19	70.4	54.5	61.3	54.8	59.9	86.5	22	38.8	29	49.4	68.8	48.8	3.42	0.71	4, 5	36	W.	2	6,375	
June.....	29.364	29.332	29.314	29.343	29.721	15	28.971	9	75.0	68.7	72.2	65.8	68.2	87.8	23	51.4	29	36.4	77.8	59.8	2.40	1.50	23, 24	31	NE.	25	6,454	
July.....	29.179	29.164	29.167	29.170	29.857	21	28.871	31	4.686	63.9	71.0	66.3	77.1	61.1	19	52.9	16	35.9	73.1	61.1	5.29	1.70	26, 27	27	W.	6	6,682	
Aug.....	29.327	29.302	29.306	29.312	29.697	9	28.903	29	69.4	68.8	73.7	68.7	88.2	19	51.4	25	37.8	77.6	61.4	2.16	1.33	8, 4	24	W.	30	6,832		
Sept.....	29.364	29.323	29.342	29.343	29.751	14	28.976	28	77.9	64.3	71.8	68.0	87.4	86.8	4	43.4	14	43.4	75.2	60.2	3.92	1.15	28	20	SW.	24	6,175	
Oct.....	29.407	29.379	29.382	29.389	29.701	25	28.910	8	8.111	52.8	56.3	54.7	55.6	70.9	4	31.4	20	48.5	68.4	48.4	2.23	0.95	1, 2	36	SW.	23	8,248	
Nov.....	29.311	29.281	29.298	29.307	29.670	3	28.658	23	1.014	38.5	44.4	38.4	40.8	64.7	10	15.8	24	48.9	47.8	33.5	4.91	0.80	23, 24	40	W.	7	8,569	
Dec.....	29.358	29.325	29.339	29.347	29.877	29	28.583	6	1.324	31.8	38.2	32.7	33.0	61.2	81	5.9	19	65.8	38.7	26.7	3.84	0.90	6, 7	41	W.	7	10,466	
Sums	351.685	351.875	351.549	351.536	.....	.....	38.472	12	10.377	557.7	625.7	572.2	583.2	.....	.....	.....	598.8	881.6	548.5	345.47	.....	.....	.....	.....	.....	.....	85,688
Means	29.307	29.281	29.286	29.295	30.015	27	28.472	12	1.865	48.5	52.1	47.7	48.8	86.2	9	—10.0	25	49.9	54.8	41.3	.....	.....	.....	.....	.....	.....	.....

January.

April.

August.

Eighteen days only.

ERIE, PA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—															
	North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.		Number of calms.		Washington time.													
	North.	North-east.	East.	Southeast.	South.	South-west.	West.	North-west.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Autumn.			
1884.																																
Jan.....	5	12	1	4	16	37	10	6	2	14.4	17.9	16.1	16.1	84.6	79.9	82.0	82.4	8.7	9.0	7.9	8.5	2	6	23	21	18	20	0	0	0		
Feb.....	8	19	3	2	15	8	24	7	1	25.1	26.3	25.6	25.7	83.8	80.4	83.5	83.2	8.6	9.1	8.1	8.6	0	8	21	24	5	24	0	1	0		
Mar.....	8	24	2	4	14	9	17	8	7	35.4	27.5	28.9	28.6	81.9	72.5	76.7	77.0	6.8	7.7	6.3	6.6	1	20	10	18	4	17	0	0	0		
Apr.....	3	23	4	4	10	23	10	9	3	33.4	33.2	34.4	33.7	77.7	65.4	76.0	73.0	6.4	5.8	4.7	5.5	9	11	10	12	0	5	0	1	0		
May.....	4	11	3	5	21	16	22	8	4	44.7	48.0	45.6	45.4	71.2	56.4	72.2	67.6	5.9	5.5	3.8	5.1	1	10	13	16	0	0	0	0	0		
June.....	10	26	7	8	18	5	0	6	1	57.4	56.8	57.7	57.3	72.6	60.0	75.7	69.4	2.9	3.2	2.4	2.9	18	9	3	16	0	0	0	0	0		
July.....	7	10	2	1	11	13	27	22	0	57.4	57.6	57.1	57.4	74.9	63.7	73.4	70.7	4.9	4.3	3.8	4.8	10	18	3	11	0	0	0	0	0		
Aug.....	12	8	6	4	24	14	16	9	0	57.1	59.3	57.3	57.9	73.9	61.5	72.4	69.3	3.3	2.7	2.3	2.8	8	3	3	17	0	0	0	0	0		
Sept.....	8	5	4	8	24	17	10	14	0	56.2	57.7	56.2	56.7	76.5	62.7	72.0	70.1	3.9	5.2	2.9	4.0	12	6	3	10	0	0	0	0	0		
Oct.....	7	12	4	5	21	16	13	15	0	45.3	47.9	47.5	46.9	76.2	67.0	77.9	73.7	6.0	5.9	5.3	5.7	10	11	16	16	0	1	0	0	0		
Nov.....	3	4	3	2	20	28	13	17	0	33.2	36.7	33.5	34.5	81.4	75.1	79.4	78.6	7.1	7.9	6.6	7.2	4	9	17	12	0	0	0	0	0		
Dec.....	5	7	1	3	8	31	19	14	8	25.9	27.4	26.9	26.7	78.6	70.3	79.2	76.0	8.4	7.7	8.6	8.2	2	5	24	20	5	22	0	0	0		
Sums..	80	101	40	55	219	192	198	130	23	475.5	494.3	484.8	484.9	934.3	817.9	921.0	891.0	71.9	74.0	63.2	63.4	98	129	139	174	36	110	0	15	2		
Means	Percentages.								Percentages.								Percentages.								Percentages.							
	7.3	14.7	3.6	5.0	19.9	17.5	18.0	11.8	2.1	39.6	41.2	40.4	40.4	77.9	68.2	76.8	74.3	6.0	6.2	5.2	5.8	23.8	35.2	38.0	47.5	10.2	30.1	0.4	10.5			

* Eighteen days only.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.48 a. m., 2.49 p. m., and 10.48 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 11 a. m., October 10, inclusive, +.009 inch; from 11 a. m., October 10, to 11 p. m., December 31, 1884, inclusive, +.007 inch.

The barometric observations may be reduced to sea-level by adding the following constants to the various months: January, 0.770; February, 0.720; March, 0.770; April, 0.750; May, 0.720; June, 0.720; July, 0.710; August, 0.710; September, 0.710; October, 0.780; November, 0.780; December, 0.770.

P. WOOD,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ESCANABA, MICH.

Location of office on December 31, 1884, Adler's Building, corner Lexington and Densman streets.

[Latitude, 45° 48' N.; longitude, 87° 5' W. Elevation of barometer above sea-level, 613 feet. Elevation of exposed thermometer above ground, 25 feet. Elevation of rain-gauge above ground, 38 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Month.	Washington time.				Monthly mean.		Washington time.				Self-registering thermometers.				Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.	Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	7 p. m.	3 p. m.	11 p. m.	Range.	Date.	Lowest.	Highest.	Date.	Range.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.	Date.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Jan.	28.403	28.370	28.397	28.390	28.948	28.948	28.631	30	1.317	8.1	14.4	8.4	8	8.638	2	19	29.3	29	17.5	4	55.7	18.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

oo Two 7 a. m. observations missed.

• December.

! March.

! June.

! August.

! February.

ESCANABA, MICH.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.				Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.					
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.	11 p. m.	Mean.	
1884.																														
Jan.....	20	0	0	5	23	8	24	13	0	2.4	4.3	3.0	0	77.3	66.9	78.0	74.1	5.7	6.0	4.1	5.3	31	0	0	1					
Feb.....	38	5	1	4	19	3	9	12	1	0.9	6.7	4.0	2.9	78.1	60.8	79.0	72.6	6.0	6.8	7.1	6.6	27	0	0	0					
Mar.....	34	6	5	9	22	4	5	10	0	8.8	16.9	15.8	4.0	79.4	57.6	79.1	72.2	5.7	5.8	4.5	5.8	28	0	0	0					
Apr.....	41	6	5	4	19	1	3	11	0	25.4	27.4	27.1	28.6	78.6	57.3	73.7	69.9	6.7	4.8	4.6	5.0	1	0	0	0					
May.....	31	5	8	12	15	4	5	13	0	36.8	38.7	39.1	38.2	73.7	58.0	73.0	68.2	7.1	5.7	5.0	5.9	23	0	0	0					
June.....	20	2	5	18	41	1	0	1	2	51.2	54.5	52.9	51.8	78.1	60.9	76.7	71.9	4.3	4.2	4.3	4.5	0	0	0	0					
July.....	27	7	3	7	16	5	18	10	0	50.6	52.6	52.2	51.8	78.3	55.7	75.0	69.7	6.2	6.2	4.5	5.3	0	0	0	0					
Aug.....	15	1	0	12	36	5	8	12	4	52.2	55.1	56.0	54.4	82.3	63.0	82.1	75.8	4.8	6.1	5.1	5.8	0	11	2	3					
Sept.....	10	5	3	8	38	5	10	8	3	50.9	53.3	52.9	52.4	83.6	67.2	80.7	77.2	5.5	5.9	5.6	5.7	0	0	10	2					
Oct.....	9	3	5	6	28	10	13	19	0	37.6	39.2	39.2	38.7	81.0	65.1	73.7	73.7	5.4	6.7	5.5	5.9	0	0	0	0					
Nov.....	9	3	0	1	21	3	29	24	0	20.4	24.7	23.8	23.0	80.5	64.8	78.1	74.5	6.2	6.3	6.1	6.1	9	0	0	0					
Dec.....	21	1	1	3	13	8	19	21	6	11.1	14.8	13.3	13.1	77.1	70.1	77.6	74.9	7.4	7.6	6.5	7.2	19	0	0	0					
Sums..	275	39	35	89	291	57	143	154	16	341.7	338.2	379.4	369.8	948.0	747.4	928.1	874.7	69.8	72.1	61.9	67.9	94	166	0	86	26				
Means.	25.0	3.6	3.2	8.1	26.5	5.2	12.9	14.6	1.5	28.5	32.4	31.6	30.8	79.0	62.3	77.3	72.9	5.8	6.0	5.3	5.7	20.8	48.4	30.9	56.0	25.7	45.4	0.9	8.7	1
											Percentages.										Percentages.									

**Two 7 a. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 8.20 a. m., 2.20 p. m., and 10.20 p. m., local time.

Correction for instrumental error of barometer used: From 0.20 a. m., January 1, to 10.20 p. m., December 31, 1884, inclusive, +.013 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.750; February, 0.750; March, 0.710; April, 0.690; May, 0.660; June, 0.650; July, 0.640; August, 0.640; September, 0.640; October, 0.670; November, 0.700; December, 0.720.

REMARKS.—On March 1, at 1.30 a. m., the elevation of the barometers were changed from 613 feet to 613 feet, by authority dated office of the Chief Signal Officer, February 14, 1884.

L. M. PINDELL,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

FORT SMITH, ARK.

Location of office on December 31, 1884, Government building, Garrison avenue.

[Latitude, 33° 22' N.; longitude, 94° 24' W. Elevation of barometer above sea-level, 451 feet.. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 29 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.	Wind.		Total movement.											
	Washington time.					Monthly mean.	Washington time.					Self-registering ther- mometers.						Mean maximum.	Mean minimum.																
	7 a. m.		3 p. m.		11 p. m.		Mon- thly	Mean.	Maximum.		Date.	Minimum.	Date.	Abso- lute	Range.																				
	In.	U.	In.	U.					In.	U.						In.	U.			In.					U.	In.	U.								
1884.	In.	U.	In.	U.	In.	U.	In.	U.	In.	U.	In.	U.	In.	U.	In.	U.	In.	U.	In.	U.	In.	U.	In.	U.	In.	U.	In.	U.	In.	U.	In.	U.			
Jan	29.800	29.763	29.709	29.784	29.804	29.760	1.034	24.3	37.2	30.1	30.5	68.6	30	—	5.0	6	72.6	42.4	20.4	1.35	55	14	28	W. E.	1.14	E.	4,687								
Feb	29.580	29.572	29.603	29.585	29.962	14	29.026	19	9.98	37.4	46.7	42.0	42.0	75.4	4	9.5	14	65.9	53.2	33.0	10.72	56	10, 11	34	N. W.	1.10	E.	4,223							
Mar	29.521	29.494	29.519	29.515	29.948	9	29.045	27	9.03	44.9	59.9	51.5	52.1	82.8	26	23.5	2	58.3	64.7	42.6	2.28	70	24, 25	28	N.	1	E.	5,629							
Apr	29.492	29.446	29.458	29.465	29.783	3	29.058	14	7.25	50.6	65.0	57.3	57.6	88.0	17	35.2	9	52.7	70.1	48.9	2.62	88	20, 21	28	N. W.	1.2	E.	4,638							
May	29.502	29.465	29.484	29.484	29.713	30	29.243	11	4.70	60.4	77.7	68.5	68.2	91.0	13	44.0	2	45.6	81.1	58.9	3.70	1.15	3	32	N.	18	E.	2,625							
June	29.513	29.475	29.486	29.491	29.651	28	29.308	24	3.48	68.4	83.5	74.0	73.2	90.5	30	54.0	11	45.5	89.5	67.0	2.41	1.13	17, 18	20	N. W.	6	E.	2,466							
July	29.480	29.441	29.447	29.466	29.680	20	29.255	30	3.75	74.0	90.4	79.2	81.2	104.5	8	65.4	11	39.1	96.7	72.1	5.98	1.02	27	28	N.	3, 27	E.	2,650							
Aug	29.585	29.544	29.555	29.581	29.744	9	29.343	28	4.01	68.0	85.1	74.5	76.3	103.7	28	58.8	11	45.3	90.1	68.0	8.73	2.97	14, 15	24	N.	3, 22	E.	2,770							
Sept	29.548	29.493	29.516	29.519	29.747	20	29.249	23	4.98	68.2	87.7	75.1	77.3	100.9	7	58.8	1	41.1	92.2	68.2	5.03	2.90	16, 17	14	E. N.	4, 17	E.	3,078							
Oct	29.685	29.635	29.639	29.660	29.985	23	29.418	26	5.77	50.7	74.8	61.5	64.3	94.0	5	39.0	28	55.6	79.3	55.0	1.32	.67	25, 26	16	N. W.	8	E.	2,510							
Nov	29.705	29.612	29.692	29.690	30.070	6	29.138	22	8.92	42.3	59.5	47.3	49.7	77.8	1	22.5	24	55.3	63.0	40.5	5.19	1.71	21, 22	24	N. W.	22, 23	E.	2,607							
Dec	29.620	29.568	29.615	29.601	30.069	18	29.109	5	9.50	32.6	42.1	35.7	35.5	72.5	4	12.2	24	60.3	44.5	29.5	6.30	1.64	23, 27	24	W.	11	W.	4,464							
Sums	355.041	354.828	354.833	354.801	8.149	679.8	809.6	694.7	711.2	50.3	604.5	58	50.3	104.5	58	50.3	604.5	58	50.3	604.5	58	50.3	604.5	58	50.3	604.5	58	50.3	604.5	58	50.3	604.5	58	50.3	
Means	29.567	29.544	29.560	29.567	30.294	15	29.026	19	8.149	679.8	809.6	694.7	711.2	50.3	604.5	58	50.3	604.5	58	50.3	604.5	58	50.3	604.5	58	50.3	604.5	58	50.3	604.5	58	50.3	604.5	58	50.3

* Two 7 a. m., two 8 p. m., and two 11 p. m. observations missed.

† January.

‡ February.

§ July.

FORT SMITH, ARK.—Continued.

[illegible]

*Two 7 a. m., two 3 p. m., and two 11 p. m. observations missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.51 a. m., 1.51 p. m., and 9.51 p. m., local time.
 NOTE.—The instrumental error of barometer used: From 7 a. m., January 1 to 3 p. m., May 12 inclusive, +.001 inch; from 7 p. m., May 12 to 11 p. m., December 31.

Corrections for instrument zero error and sensitivity may be reduced to ± 0.1 inch.
 884. Inclusive, + .057 inch.
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.500; February, 0.500; March, 0.490; April, 0.480; May, 0.470; June, 0.460; July, 0.460; August, 0.460; September, 0.470; October, 0.480; November, 0.490; December, 0.500.

the 20th of July. Elevation changed from 449 to 451 feet; authorized by letter dated August 25, 1884. River was higher February 14 than it has been since 1877; river was higher May, 1880, than it has been since 1877. Tornado passed near the station on the 27th of July.

ISAAC M. CLINE,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

GALVESTON, TEX.

Location of office on December 31, 1884, custom-house building, Mechanic street, between Twentieth and Twenty-first streets.

[Latitude, 29° 19' N.; longitude 94° 47' W. Elevation of barometer above sea-level, 40 feet. Elevation of exposed thermometer above ground, 37 feet. Elevation of rain-gauge above ground, 51 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.								Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Washington time.				Monthly mean.						Self-registering thermometers.				Any 3 consecutive 8-hourly measurements.				Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	11 p. m.				Mean maximum.						Mean minimum.				Total amount.				Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Last 8 hours.	Date.	Miles.	Direction from—	Date.	Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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January.

April.

July.

GALVESTON, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.			3 p. m.			11 p. m.			Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.		
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																	
1864.																																		
Jan.	31	13	7	10	12	5	4	7	0	23.0	40.6	42.4	40.3	79.6	74.3	72.1	80.3	78.4	5.9	5.2	4.6	5.2	9	12	10	12	0	0	0	0	0	0	0	
Feb.	16	3	5	17	37	2	8	4	0	53.0	53.5	52.9	53.1	84.5	72.1	68.8	82.1	79.0	5.0	6.3	2.9	6.3	7	16	10	12	0	0	0	0	0	0	0	
Mar.	13	10	6	25	23	3	8	4	0	56.3	56.5	55.7	57.2	84.4	68.8	64.4	80.8	78.4	6.0	6.3	4.6	6.3	8	10	13	9	0	0	0	0	0	0	0	
Apr.	10	5	10	28	19	8	3	10	0	59.0	60.1	60.2	59.8	82.8	71.6	68.0	81.8	78.4	5.7	5.6	4.6	5.6	8	13	9	7	0	0	0	0	0	0	0	
May	7	4	14	19	38	6	2	13	0	67.8	67.5	68.9	68.1	84.0	68.6	65.9	81.8	78.1	5.7	5.2	4.5	5.2	10	10	11	8	0	0	0	0	0	0	0	
June	6	3	11	22	38	8	2	3	1	72.4	71.2	72.0	71.9	82.1	63.5	65.9	75.5	73.7	4.5	4.0	2.4	4.0	14	13	8	12	0	0	0	0	0	0	0	
July	1	0	1	9	45	32	6	2	0	70.7	72.6	77.1	76.7	83.9	65.9	65.9	79.5	78.1	3.8	3.2	1.6	3.2	19	12	0	0	0	0	0	0	0	0	0	
Aug.	4	0	12	37	28	3	1	0	0	74.4	72.9	73.7	74.0	80.7	67.3	67.3	74.6	72.6	4.2	4.8	2.7	4.8	19	12	0	0	0	0	0	0	0	0	0	
Sept.	3	8	4	44	31	1	4	1	2	65.6	65.7	66.6	66.0	80.7	67.7	67.7	77.2	75.2	3.9	4.4	2.9	4.4	13	14	4	11	0	0	0	0	0	0	0	
Oct.	20	19	15	30	1	4	1	0	2	68.0	68.7	67.7	68.6	80.7	67.7	67.7	77.2	75.2	4.2	3.7	2.4	3.7	14	14	4	10	0	0	0	0	0	0	0	
Nov.	15	22	27	11	3	2	1	9	0	58.1	53.8	54.7	53.9	80.6	69.1	68.6	78.3	76.0	4.2	3.7	5.3	5.6	14	14	10	16	0	0	0	0	0	0	0	
Dec.	16	12	11	12	20	9	6	6	1	51.6	53.0	52.5	52.4	83.6	80.2	80.1	83.8	83.5	3.9	5.6	5.3	5.6	6	15	10	16	0	0	0	0	0	0	0	
Sums	142	102	123	265	285	85	41	50	5	741.9	744.9	753.8	747.1	992.1	830.9	848.3	923.7	58.1	57.6	30.9	51.7	141	153	72	119	0	12	29	34	0	0	0	0	
Means	Percentages.																																	
	12.9	9.3	11.2	24.1	26.0	7.7	3.7	4.6	.5	61.8	62.1	62.8	62.2	82.7	69.2	79.0	77.0	4.8	4.8	3.3	4.3	38.5	41.8	18.7	32.5	0	3.3	7.9	3.3	0	0	0	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.49 a. m., 1.49 p. m., and 9.49 p. m., local time.
Correction for instrumental error of barometer used: From 3.49 a. m., January 1, to 9.49 p. m., December 31, 1884, inclusive, +.008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

E. O'C. MACINERNEY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

GRAND HAVEN, MICH.

Location of office on December 31, 1884, Cutler House, corner Third and Washington streets.

[Latitude, 43° 5' N.; longitude, 80° 19' W. Elevation of barometer above sea-level, 620 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 78 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.								Precipitation.				Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
Month.	Washington time.			Monthly mean.			Self-registering thermometers.			Washington time.		Mean maximum.			Mean minimum.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	7 a. m.		11 p. m.	Monthly mean.		Range.	Date.	Lowest.	Date.	Highest.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	In.	Th.	In.	In.	Th.																			In.	Th.		In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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* One 7 a. m. observation taken late.

† January.

‡ April.

§ June.

|| December.

GRAND HAVEN, MICH.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew point.		Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunderstorms.	Aurora.	
1884.																											
Jan.	19	2	0	0	0	0	0	0	0	13.7	16.8	14.7	15.1	80.5	82.1	78.9	83.3	77.8	8.9	8.8	25	23	21	30	0	0	0
Feb.	8	22	18	12	8	9	9	16	1	17.6	21.9	20.2	19.9	82.1	82.1	78.9	83.3	81.4	8.8	8.8	22	36	18	27	0	0	0
Mar.	13	14	13	2	7	12	14	11	14	31.5	32.0	31.0	31.5	79.3	79.3	71.2	78.6	76.4	6.5	6.5	13	36	9	18	0	0	0
Apr.	9	7	6	7	12	18	8	0	0	44.1	44.1	43.7	43.9	73.4	73.4	61.3	69.1	67.9	5.5	5.5	12	22	0	0	0	0	0
May	4	20	14	2	13	18	1	5	56.7	58.0	58.0	55.8	56.8	72.6	72.6	61.6	69.6	69.0	4.7	4.8	17	15	0	0	0	0	0
June	7	9	4	6	6	13	14	24	15	56.7	58.5	57.6	57.9	70.6	70.6	66.6	77.6	73.6	4.4	4.4	16	9	0	0	0	0	0
July	8	4	6	10	14	15	13	18	2	56.6	57.8	57.5	57.3	82.7	82.7	65.1	78.2	75.5	3.0	3.0	21	8	0	0	0	0	0
Aug.	7	9	4	10	14	15	13	18	0	55.5	57.8	57.0	56.8	81.6	81.6	65.3	77.4	74.8	4.4	4.4	18	3	0	0	0	0	0
Sept.	5	5	9	13	29	11	10	9	1	44.4	46.4	45.0	45.3	78.2	78.2	66.6	74.6	73.1	4.5	4.5	11	14	0	0	0	0	0
Oct.	6	4	9	11	26	17	10	8	0	29.8	32.4	31.2	31.1	80.0	80.0	71.6	76.0	75.9	7.3	7.0	11	14	0	0	0	0	0
Nov.	9	9	6	7	18	11	13	11	2	21.8	25.1	22.9	23.3	81.4	81.4	61.3	70.5	81.1	8.8	8.6	6	19	15	21	0	0	0
Dec.	3	9	19	7	18	11	13	11	2	21.8	25.1	22.9	23.3	81.4	81.4	61.3	70.5	81.1	8.8	8.6	6	19	15	21	0	0	0
Sums ..	97	124	112	95	178	150	166	137	36	451.2	478.3	462.6	464.1	940.6	940.6	821.5	911.1	891.1	78.8	77.1	149	183	59	117	0	26	3
Percentages.																											
8.8 11 310.2 8.7 16.3 13.7 15.1 10.2 5 3.3 15.8 32.0 49.7 15.3 32.0 67.1 1.8 17.9 41.0 41.0 49.7 15.3 32.0 67.1 1.8 17.9 41.0 41.0 49.7 15.3 32.0 67.1 1.8																											
Means.																											

* One 7 a. m. observation taken late.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 6.23 a. m., 2.23 p. m., and 10.23 p. m., local time.

Correction for instrumental error of barometer used: From 6.23 a. m., January 1, to 10.23 p. m., December 31, 1884, inclusive, +.002 inch.

The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.710; February, 0.710; March, 0.700; April, 0.690; May, 0.690; June, 0.680; July, 0.650; August, 0.650; September, 0.660; October, 0.670; November, 0.700; December, 0.710.

REMARKS.—January 2 and 3, very severe gale; harbor entrance blockaded by ice the better portion of the month. February 12, severe sleet-storm; harbor continued blockaded by heavy ice the better part of the month. March 22, heavy rise of Grand River causing damage to lumber-booms and clearing harbor of ice. April 17, 22, auroras. May 23, last light frost of season. September 21, first light frost of season; 13th, aurora. October 9, first killing frost of season; 17th, meteor. December 29 and 30, unusually warm.

JOSEPH E. MUELLER,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1894—Continued.

GRANT, FORT, ARIZ.

Location of office on December 31, 1894, post quarters.

[Latitude, 32° 38' N.; longitude, 109° 57' W. Elevation of barometer above sea-level, 4,856 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.			Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.					Self-registering thermometers.					Any 3 consecutive hourly measurements.	Largest amount.	Mean maximum.	Mean minimum.	Total amount.	Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.						Maximum.	Date.	Minimum.				Date.	Absolute range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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* Record for twenty-two days; minimum broken.

January.

December.

July.

Month.	Winds at 7 a. m., 9 and 11 p. m.; Washington time: Number of times observed blowing from—							Number of calms.	Dew-point.			Relative humidity (per cent.).			Cloudiness (in tenths).			Number of days—												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.		Northwest.	7 a. m.	9 p. m.	11 p. m.	Mean.	7 a. m.	9 p. m.	11 p. m.	Mean.	7 a. m.	9 p. m.	11 p. m.	Mean.	Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	
1884.																														
Jan.	10	13	12	16	10	9	8	15	0	22.4	25.1	24.0	23.8	64.6	41.7	50.8	52.2	3.8	3.4	2.5	2.5	3.2	18	9	4	4	0	16	0	0
Feb.	19	15	7	11	8	6	5	15	0	23.4	32.7	30.7	30.8	68.8	55.1	53.8	60.9	4.5	5.1	4.2	4.1	4.6	13	7	6	11	2	0	0	0
Mar.	14	19	10	8	6	5	14	16	0	23.8	29.3	30.8	29.5	62.7	39.5	54.2	52.1	4.4	3.5	3.2	2.6	2.5	20	9	9	12	6	6	0	1
Apr.	25	11	12	6	2	5	18	23	0	22.8	24.1	26.6	24.8	44.8	24.6	35.8	35.1	2.1	2.6	1.9	2.1	2.6	13	13	1	12	4	0	0	0
May	22	10	11	13	9	4	15	9	0	27.7	28.0	30.0	28.6	38.0	21.1	31.0	30.9	2.1	2.6	1.6	2.1	2.5	18	11	2	6	0	0	0	0
June	23	12	14	7	11	4	6	13	0	32.4	32.8	33.8	33.0	30.1	18.5	24.1	24.0	2.1	2.6	2.8	3.0	2.5	17	12	3	6	0	0	0	0
July	18	7	12	11	9	4	10	21	1	45.8	45.0	46.8	45.9	40.2	21.5	33.0	31.6	3.9	4.1	4.6	4.2	4.1	11	12	2	6	0	0	0	0
Aug.	17	10	9	13	5	8	11	9	16	49.8	49.5	51.5	48.3	57.6	30.5	43.0	46.0	2.8	2.9	1.5	2.8	17	16	1	6	0	0	0	0	
Sept.	21	17	18	12	7	2	5	15	3	44.2	44.2	44.2	44.2	54.0	30.5	42.4	42.3	3.6	2.8	2.4	3.3	13	15	8	8	0	0	0	0	
Oct.	7	15	18	34	7	6	8	8	1	44.2	46.2	44.0	44.9	63.8	45.1	54.3	54.4	4.6	4.6	2.9	3.3	24	4	4	8	0	0	0	0	
Nov.	9	13	12	16	6	5	11	5	11	35.9	35.5	31.9	32.8	55.3	35.2	46.8	45.6	1.9	2.9	0.9	1.7	14	4	2	10	0	0	0	0	
Dec.	20	20	2	16	13	5	11	7	0	25.9	32.7	28.6	29.1	66.8	50.8	60.2	59.2	4.5	4.4	4.4	4.6	14	4	3	11	0	0	0	0	
Sum.	205	162	127	162	92	62	115	140	33	404.2	425.1	422.9	417.6	646.7	415.9	540.5	534.3	37.0	42.6	33.9	37.8	206	118	47	90	0	27	51	23	
Means.	Percentages.																													

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.48 a. m., 12.48 p. m., and 8.48 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.010 inch. The barometric observations may be reduced to sea-level by the following constants for the various months: January, 4.90; February, 4.86; March, 4.83; April, 4.73; May, 4.61; June, 4.54; July, 4.57; August, 4.57; September, 4.60; October, 4.70; November, 4.84; December, 4.88.

REMARKS.—Last snow of spring occurred on March 24; last frost of spring occurred on May 3; first frost of autumn occurred on October 28, and first snow of winter occurred on December 10.

P. CONNOR,
Corporal, Signal Corps, U. S. A.

Meteorological summary for the last three months of the year ending December 31, 1884—Continued.

GREENCASTLE, IND.

Location of office on December 31, 1884, De Pauw University.

[Latitude, 39° 40' N.; longitude, 86° 43' W. Elevation of barometer above sea-level, 885 feet. Elevation of exposed thermometer above ground, 38 feet. Elevation of rain-gauge above ground, 69 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.								Precipitation.			Wind.			Total movement.							
	Washington time.			Monthly mean.			Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.				Total amount.	In.	In.	In.	Any 2 consecutive 8-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.						
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.					Highest.	In.	In.	In.	Date.	Minimum.	Date.						Absolute range.	Mean maximum.			Mean minimum.					
																												7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Mean maximum.	Mean minimum.
1884.	In.	In.	In.	In.	In.	In.	W.	In.	In.	In.	W.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	In.	In.	In.	Any 2 consecutive 8-hourly measurements.	Miles.	Direction from—	Date.	Miles.	Prevailing direction.
Jan.	29.239	29.184	29.197	29.203	29.516	15	28.915	8	.001	52.3	64.6	66.1	57.785.8	2	28.2	24	57.6	50.4	1.27	.90	28	27	24	SW.	31	24	8,945					
Feb.	29.183	29.126	29.146	29.142	29.532	6	28.562	23	.906	30.1	46.8	39.7	40.946.1	1	9.7	24	56.4	48.6	1.78	.60	22	28	29	SW.	28	29	5,465					
Mar.	29.168	29.139	29.168	29.187	29.631	19	28.418	6	1.213	26.1	30.7	27.2	28.056.8	6	-14.6	19	72.8	35.9	6.74	1.09	27	28	30	SE.	31	30	6,493					
Apr.																																
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Oct.																																
Nov.																																
Dec.																																

Observations began 7 a. m., October 1.

GREENCASTLE, IND.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.					
										7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.
1864.																											
Jan.																											
Feb.																											
Mar.																											
Apr.																											
May																											
June																											
July																											
Aug.																											
Sept.																											
Oct.	4	3	17	5	11	27	23	8	0	47.5	48.4	49.3	48.7	83.9	61.3	70.2	74.8	2.3	2.2	15	14	2	8	0	3	0	0
Nov.	7	14	6	9	7	23	11	13	0	31.9	35.4	34.6	34.0	84.7	65.3	82.2	77.4	3.9	4.3	13	8	9	9	1	12	0	0
Dec.	7	11	5	24	15	9	10	12	0	22.6	24.8	23.4	23.6	86.1	70.7	86.9	83.9	7.0	7.7	5	4	22	20	11	24	0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 6:21 a. m., 2:31 p. m., and 10:31 p. m. local time.
Correction for instrumental error of barometer used: From 7 a. m., October 1, to 11 p. m., December 31, 1884, inclusive, + .002 inch.
REMARKS.—Station opened at 7 a. m., October 1, 1884.

ORIN PARKER,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

HATTERAS, N. C.

Location of office on December 31, 1884, Neal's House.

[Latitude, 35° 19' N.; longitude, 75° 40' W. Elevation of barometer above sea-level, 12 feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 3 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.								
	Washington time.			Monthly mean.	Highest.			Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.	Miles.					
	7 a. m.	3 p. m.	11 p. m.		7 a. m.	3 p. m.	11 p. m.				Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.			Mean maximum.	Mean minimum.	Total amount.			Largest amount.	Date.	Miles.	Direction from—	Date.
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.					
Jan.....	30.173	30.132	30.164	30.156	30.734	27	23.405	8	1.829	41.0	42.6	41.9	42.2	68.0	24	15.0	6	53.0	50.1	34.5	7.64	2.79	8	SW.	11,024			
Feb.....	30.095	30.076	30.118	30.096	30.554	16	23.272	23	1.182	53.0	53.6	53.6	54.0	71.0	9	27.0	29	44.0	61.4	46.3	5.18	1.60	17	N.E. } S.W. }	8 839			
Mar.....	30.056	30.002	30.049	30.036	30.441	16	23.525	29	.916	50.8	53.4	53.3	53.3	69.8	25	24.0	4	43.8	59.8	46.2	5.84	1.58	26	N.W.	8 906			
Apr.....	29.996	29.858	29.887	29.887	30.224	12	23.241	2	.968	53.4	58.1	53.0	54.8	69.1	29	41.6	13	27.5	60.6	48.8	8.51	2.81	15	N.E. } N.W. }	8 903			
May.....	29.990	29.966	29.979	29.978	30.280	8	23.678	11	.602	66.3	70.7	65.5	67.5	80.5	25	43.2	1	32.3	73.5	61.7	2.46	.95	9	N.W. } N.W. }	7 057			
June.....	30.060	30.038	30.048	30.048	30.284	16	23.765	9	.519	71.2	75.6	70.5	72.4	83.2	24	56.5	3	33.7	77.6	66.9	2.51	.95	13	S.W.	7 919			
July.....	30.039	30.008	30.023	30.021	30.733	16	29.733	16	.394	73.9	79.4	74.9	76.7	85.0	24	63.5	9	31.5	81.4	71.8	0.51	4.16	11	S.W. } S.W. }	7 906			
Aug.....	30.034	30.019	30.030	30.028	30.186	19	29.766	17	.420	75.1	78.1	74.5	76.9	85.0	27	68.9	15	31.1	80.3	72.2	5.80	1.55	8	N.E. } N.E. }	7 492			
Sept.....	30.114	30.087	30.118	30.105	30.775	26	29.768	17	.507	72.7	78.5	73.2	75.1	83.5	5	64.1	19	21.4	80.4	70.0	1.01	.60	13	N.E. } N.E. }	6 973			
Oct.....	30.149	30.114	30.124	30.122	30.548	20	29.844	30	.704	65.7	70.5	66.0	67.4	83.2	6	47.0	25	34.2	73.0	63.8	1.28	.85	30	N.E. } N.E. }	6 510			
Nov.....	30.098	30.057	30.078	30.076	30.300	7	29.519	28	.671	54.2	58.7	54.3	56.4	74.8	4	40.9	23	33.9	62.4	50.8	0.95	0.50	15	N.E. } N.E. }	6 531			
Dec.....	30.176	30.181	30.164	30.153	30.515	28	29.771	18	.744	43.8	52.4	50.1	50.4	71.0	15	26.2	19	50.8	57.5	44.8	7.41	2.26	21	N.	10,386			
Sum.....	300.764	300.363	300.682	300.616	.....	.....	.....	.....	9.171	729.1	773.7	730.8	748.1	.....	.....	.....	.....	497.2	618.0	675.5	866.41	.....	.....	86.816	N.E.
Means.....	30.065	30.033	30.067	30.061	30.734	27	23.241	12	.764	60.8	64.9	60.9	63.2	86.5	19	15.0	6	53.9	68.3	58.8	.....	.....	.....	.....	N.E.

• January.

† April.

‡ September.

HATTERAS, N. C.—Continued.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.06 a. m., 3.06 p. m., and 11.06 p. m., local time.

NOV.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.00 a. m., 3.00 p. m., and 11.00 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., December 31, 1884, inclusive, +.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.010; February, 0.010; March, 0.010; April, 0.010; May, 0.010; June, 0.010; July, 0.010; August, 0.010; September, 0.010; October, 0.010; November, 0.010; December, 0.010.

R. M. CRAWFORD,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

HELENA, MONT.

Location of office on December 31, 1884, corner Price and Main streets.

[Latitude, 46° 34' N.; longitude, 112° 4' W. Elevation of barometer above sea-level, 4,044 (B) feet. Elevation of exposed thermometer above ground, 31 feet. Elevation of rain-gauge above ground, 57 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.									
	Washington time.					Washington time.					Self-registering ther- mometers.					Any 2 con- secutive 8-hourly measure- ments.					Maximum hourly velocity during month.		Prevailing direction.											
	7 p. m.		3 p. m.		11 p. m.		Monthly mean.		Maximum.		Minimum.		Date.		Absolute range.		Mean maximum.		Mean minimum.		Total amount.		Date.		Direction from—		Date.		Miles.					
	In.	Bar.	In.	Bar.	In.	Bar.	In.	Bar.	In.	Bar.	In.	Bar.	In.	Bar.	In.	Bar.	In.	Bar.	In.	Bar.	In.	Bar.	In.	Bar.	In.	Bar.	In.	Bar.	In.	Bar.				
1884.																																		
Jan.	25.928	25.908	25.910	25.915	26.396	1	25.537	26	850	77.6	74.0	71.3	11.6	51.2	12	-13.0	4	64.2	24.8	10.1	8.75	1.35	2.8	44	SW.	12	N.	2,860						
Feb.	25.778	25.778	25.801	25.786	26.279	26	25.101	17	1,178	11.8	17.6	14.8	14.6	52.0	24	-20.0	11	72.0	22.4	7.3	1.83	.24	5	83	W.	20	NW.	3,789						
Mar.	25.715	25.718	25.702	25.712	26.044	13	25.138	10	.906	24.2	34.0	29.2	29.1	51.0	22	9.0	7	60.0	37.6	22.6	.59	.24	6	24	SW.	20	NW.	3,625						
Apr.	25.800	25.780	25.785	25.791	26.110	18	25.437	13	.673	35.1	47.9	41.7	41.6	63.0	22	26.0	28	37.0	51.4	33.8	1.06	.86	15, 16	25	E.	12	W.	4,080						
May	25.844	25.830	25.820	25.831	26.118	20	25.544	3	.574	44.7	61.7	55.3	53.9	78.0	25	31.5	1	44.5	65.5	43.9	.63	.29	29	28	25	SW.	27	SW.	4,884					
June	25.828	25.788	25.792	25.803	26.030	18	25.098	13	.442	56.2	69.5	63.9	62.9	88.0	19	43.5	25	42.5	74.8	54.2	4.29	.94	10, 11	28	SW.	14	SW.	4,856						
July	25.865	25.833	25.837	25.845	26.112	8	25.541	6	.571	53.7	69.9	61.0	62.5	84.0	6	47.0	5	37.6	73.6	53.1	8.25	.80	22	34	W.	25	SW.	4,979						
Aug.	25.901	25.880	25.868	25.883	26.094	20	25.644	26	.410	57.5	73.9	68.9	68.2	88.0	26	42.1	20	46.1	78.8	54.1	4.47	.86	19	22	W.	1	SW.	4,635						
Sept.	25.798	25.765	25.763	25.791	26.047	19	25.504	30	.543	44.6	54.7	49.8	49.7	74.0	21	31.0	30	43.0	59.4	43.0	1.30	.48	4	29	W.	2	SW.	4,823						
Oct.	25.836	25.826	25.844	25.835	26.252	16	25.280	1	.972	41.4	52.8	46.8	47.0	74.0	9	28.0	7	46.0	57.6	38.6	.49	.31	2, 3	29	W.	25	W.	4,631						
Nov.	25.912	25.919	25.914	25.915	26.157	30	25.617	20	.540	82.8	40.1	36.3	36.4	62.0	7	7.5	22	54.5	45.0	28.8	.46	.23	21, 22	47	W.	26	W.	3,664						
Dec.	25.792	25.767	25.776	25.775	26.243	9	25.315	26	.928	5.5	9.2	6.2	7.0	52.0	2	-28.0	24	80.0	14.5	0.5	1.56	.50	18	24	W.	5	NW.	2,686						
Sums	309,965	309,819	300,841	300,882	11	8,629	413.6	545.3	490.2	483.1				
Means.	25.832	25.818	25.820	25.823	26.366	11	7,719	84.5	45.4	40.8	40.2	38.2	326	-28.0	324	52.8	50.4	82.7				
																														11 days.	1 January.	1 February.	1 August.	1 December.

* 14 days.

† January.

‡ February.

§ August.

|| December.

HELENA, MONT.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).			Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.							Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
										7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.										Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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* 14 days.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time correspond to 4.40 a. m., 12.40 p. m., and 8.40 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., January 1 to 7 a. m., November 3, +.007 inch; 8 p. m., November 3, +.007 inch; 8 p. m., November 31, 1884, +.005 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.83; February, 4.35; March, 4.32; April, 4.21; May, 4.12; June, 4.07; July, 4.01; August, 4.04; September, 4.12; October, 4.25; November, 4.33; December, 4.33.

A. L. MATHEWS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1894—Continued.

HURON, DAK.

Location of office on December 31, 1894, Parker Block, Third street.

[Latitude, 44° 21' N.; longitude, 98° 9' W. Elevation of barometer above sea-level, 1,305 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 36 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Washington time.					Monthly mean.	Washington time.					Self-registering thermometers.					Total amount.	Any consecutive 8-hourly measure-ments.	Date.	Miles.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	7 p. m.	9 p. m.	11 p. m.	Monthly mean.	Date.		Range.	Lowest.	Date.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	9 p. m.					11 p. m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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* January.

† March.

‡ September.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—						Dew-point		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																
	Number of calms.						7 a. m.		8 p. m.		11 p. m.		Mean.		7 a. m.		8 p. m.		11 p. m.		Mean.		Clear.	Partly.	Cloudy.	On which or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.
							7 a. m.		8 p. m.		11 p. m.		Mean.		7 a. m.		8 p. m.		11 p. m.		Mean.										
							North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.									
1884.	18	21	21	11	12	5	7	25	2	2.8	5.6	1.1	1.5	72.5	66.0	70.5	72.0	13	15	3	4	21	31	0	0	0	0	0	0	0	
Jan.....	31	15	21	11	12	5	7	25	2	2.8	5.6	1.1	1.5	72.5	66.0	70.5	72.0	13	15	3	4	21	31	0	0	0	0	0	0	0	
Feb.....	25	13	21	11	12	5	7	25	2	2.8	5.6	1.1	1.5	72.5	66.0	70.5	72.0	13	15	3	4	21	31	0	0	0	0	0	0	0	
Mar.....	21	13	21	11	12	5	7	25	2	2.8	5.6	1.1	1.5	72.5	66.0	70.5	72.0	13	15	3	4	21	31	0	0	0	0	0	0	0	
Apr.....	18	11	7	25	3	4	4	16	0	42.6	43.3	45.4	43.8	83.7	83.7	71.2	67.7	14	13	9	12	6	1	0	1	0	0	0	0	0	0
May.....	9	6	5	37	27	2	0	3	1	87.6	63.2	60.9	60.2	87.8	53.5	71.2	74.7	14	13	9	6	0	1	0	0	0	0	0	0	0	0
June.....	10	17	8	25	5	6	2	18	2	87.0	59.5	59.5	58.8	89.1	59.2	80.2	77.0	13	17	9	18	0	0	0	0	0	0	0	0	0	0
July.....	7	2	1	37	18	2	3	23	0	84.1	59.5	53.1	57.2	89.1	57.2	80.2	75.5	13	17	9	6	0	0	0	0	0	0	0	0	0	0
Aug.....	16	9	3	37	13	4	8	8	3	47.1	49.5	49.7	48.5	86.2	49.3	78.6	70.7	12	15	10	8	0	0	0	0	0	0	0	0	0	0
Sept.....	17	2	4	20	19	5	5	20	1	35.4	37.5	38.8	37.2	78.6	47.7	70.7	65.7	15	10	6	7	0	12	0	0	0	0	0	0	0	0
Oct.....	23	4	4	5	24	2	4	21	3	15.3	28.4	23.0	23.2	80.9	62.8	78.3	73.3	10	15	7	10	21	29	0	0	0	0	0	0	0	0
Nov.....	20	3	0	14	10	4	5	23	4	1.7	5.2	1.0	1.5	75.4	67.5	78.3	73.0	10	15	6	10	31	31	0	0	0	0	0	0	0	0
Dec.....	20	3	0	14	10	4	5	23	4	1.7	5.2	1.0	1.5	75.4	67.5	78.3	73.0	10	15	6	10	31	31	0	0	0	0	0	0	0	0
Sums ..	214	85	53	216	154	41	44	245	17	351.0	409.6	390.7	393.8	990.2	712.9	916.7	876.2	139	155	72	111	77	177	4	38	4	38	4	38	4	38
Means ..	19.5	7.7	4.8	22.3	14.4	3.7	4.0	22.3	1.5	29.2	34.1	32.6	32.0	83.3	59.4	76.4	73.0	38	42.3	19.7	20.3	21	43.4	1.1	91.1	1.1	91.1	1.1	91.1	1.1	91.1
															Percentages.																

NOTE.—7 a. m., 8 p. m., and 11 p. m. Washington time, correspond to 5.56 a. m., 1.56 p. m., and 0.56 p. m., local time. Corrections for instrumental error of barometer used: From 5.56 a. m., January 1, to 0.56 p. m., December 16, inclusive, + .010 inch; from 5.56 a. m., December 17, to 9.56 p. m., December 31, 1884, inclusive, + .07.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.540; February, 1.530; March, 1.490; April, 1.450; May, 1.360; June, 1.360; July, 1.320; August, 1.340; September, 1.380; October, 1.430; November, 1.480; December, 1.540.

REMARKS.—January 10, electric storm; May 12, last frost; June 24, lightning from cloudless sky; July 21 and 26, destructive hail-storms; August 1, destructive hail-storm; August 28, tornado; September 11, first light frost; October 5, first killing frost; October 20, first snow.

SAM. W. GLENN
Sergeant Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

INDIANA POLIS, IND.

Location of office on December 31, 1884, Fletcher and Sharpe's Block, corner of Washington and Pennsylvania streets.

[Latitude, 39° 46' N.; longitude, 86° 10' W. Elevation of barometer above sea-level, 753 feet. Elevation of exposed thermometer above ground, 52 feet. Elevation of rain-gauge above ground, 74 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.				Wind.			
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Total amount.		Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	
	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Range.	Lowest.	Date.	Highest.	Monthly mean.	Date.	Largest amount.	Date.	Miles.	Direction from—	Date.	Miles.	Direction.
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Jan.....	29.845	29.318	29.352	29.338	29.856	29.778	1	1.078	28.778	20	29.856	29.318	30	1.05	37	18, 19	NW.	31	SW.	5,057
Feb.....	29.213	29.164	29.204	29.190	29.701	29.633	19	1.168	28.965	15	29.701	29.164	20	1.07	4	18, 19	NW.	25	NW.	4,636
Mar.....	29.202	29.172	29.196	29.190	29.589	29.607	23	.962	28.607	23	29.589	29.172	24	3.01	.85	11, 24	NW.	25	NW.	5,090
Apr.....	29.150	29.107	29.128	29.118	29.370	29.493	15	.877	28.493	15	29.370	29.107	20	2.89	.63	20, 30	W.	27	SE.	5,193
May.....	29.169	29.141	29.159	29.156	29.511	29.812	19	.699	28.812	19	29.511	29.141	20	4.80	1.24	18, 19	W.	2	SW.	4,275
June.....	29.235	29.199	29.224	29.219	29.445	29.807	9	.638	28.807	9	29.445	29.199	20	4.11	1.13	8, 9	W.	4	S.	3,580
July.....	29.149	29.124	29.141	29.138	29.373	29.971	4	.402	28.971	4	29.373	29.124	24	6.03	1.48	24, 25	W.	28	NW.	3,390
Aug.....	29.276	29.234	29.252	29.254	29.503	29.919	29	.594	28.919	29	29.503	29.234	30	.46	.32	7, 17	NW.	41	S.	3,357
Sept.....	29.280	29.240	29.267	29.262	29.554	29.982	28	.592	28.982	28	29.554	29.240	30	3.09	.83	27, 28	NW.	17	S.	3,664
Oct.....	29.266	29.223	29.239	29.243	29.559	29.944	8	.615	28.944	8	29.559	29.223	24	2.31	1.38	24, 27	NW.	23	S.	3,481
Nov.....	29.267	29.244	29.256	29.251	29.668	29.966	23	1.022	28.966	23	29.668	29.244	24	1.46	.49	23, 24	W.	23	W.	4,065
Dec.....	29.300	29.251	29.306	29.296	29.785	29.944	6	1.241	28.944	6	29.785	29.251	27	6.05	2.16	27, 28	W.	23	SE.	4,829
Sum.....	29.242	29.200	29.216	29.208	29.580	29.911	115	1.000	28.911	115	29.580	29.200	30	3.00	.90	.....	.....	.....	.....	50,567
Means.....	29.245	29.210	29.226	29.223	29.585	29.915	115	1.000	28.915	115	29.585	29.210	30	3.00	.90	.....	.....	.....	.....	50,567

1 June.

1 April.

1 January.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—										
	Number of calms.										7 a. m.		3 p. m.		11 p. m.		Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.
1884.	North.	North-east.	East.	South-east.	South.	South-west.	West.	North-west.	1	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Aurora.
Jan.....	12	7	5	2	16	19	17	14	1	11.1	12.8	12.7	12.2	72.7	58.0	71.0	67.2	6.4	5.6	4.3	5.4	6	16	9	12	17	28	0	0	
Feb.....	8	5	13	6	17	11	5	20	2	24.3	23.4	27.9	26.9	75.4	63.6	77.4	73.1	7.1	8.4	6.7	7.4	4	9	16	18	5	18	0	0	
Mar.....	10	9	12	13	15	6	7	20	1	24.3	23.4	27.9	28.4	75.4	63.6	77.4	73.1	6.5	7.4	6.9	6.9	3	14	14	16	7	13	0	0	
Apr.....	12	11	8	10	9	4	12	16	2	33.7	33.3	38.4	35.1	66.1	49.5	61.6	59.1	7.1	7.5	6.0	6.9	5	8	17	17	0	0	0	0	
May.....	8	12	4	7	11	22	9	17	3	47.1	46.0	49.1	47.6	71.0	48.3	66.8	62.0	6.6	7.5	3.6	5.0	10	13	8	15	0	0	0	0	
June.....	3	11	14	17	19	6	3	6	11	59.0	59.8	60.4	59.7	71.7	53.0	69.0	64.5	6.0	7.2	4.3	5.8	8	12	10	9	0	0	0	0	
July.....	16	8	2	2	6	17	14	20	8	60.0	53.8	61.5	60.1	72.9	50.6	70.1	64.5	5.5	6.3	4.5	5.4	8	14	9	16	0	0	0	0	
Aug.....	16	11	5	1	19	12	9	14	6	56.7	53.6	57.9	56.7	73.0	43.8	63.8	60.2	3.3	5.5	2.1	3.6	17	12	3	7	0	0	0	0	
Sept.....	3	7	4	9	35	14	2	9	7	56.7	53.9	57.2	56.6	74.2	48.9	63.9	62.3	3.7	5.2	3.9	5.2	16	7	11	0	0	0	0	0	
Oct.....	5	14	7	8	19	15	8	10	6	47.4	47.7	49.4	48.2	84.5	54.2	75.1	71.3	4.3	4.9	4.2	3.8	13	14	4	9	0	0	0	1	
Nov.....	6	5	5	6	16	17	19	10	6	32.7	35.6	35.5	34.6	87.6	63.8	82.2	77.9	4.5	4.5	3.7	4.2	19	10	7	8	1	8	0	0	
Dec.....	7	8	6	26	7	12	14	13	0	24.7	23.8	25.8	25.8	89.8	78.4	87.8	85.2	8.0	7.7	6.5	7.4	5	6	20	23	10	21	0	0	
Sums ..	106	108	85	113	189	155	119	169	54	480.3	491.8	503.7	491.9	910.8	667.2	854.5	810.8	70.0	75.5	55.2	66.7	99	144	123	160	40	91	5	57	1
										Percentages.																				
Means.	9.7	9.8	7.7	10.3	17.2	14.1	11.0	8.15	4.9	40.0	41.0	42.0	41.0	73.9	55.6	71.2	67.6	5.8	6.3	4.6	5.6	27.1	30.3	33.6	43.7	10.9	24.9	1.4	15.0	0.3

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.24 a. m., 2.24 p. m., and 10.24 p. m., local time. Correction for instrumental error of barometer used: From 6.53 a. m., January 1, to 10.24 p. m., December 31, 1884, inclusive, +.013 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.840; February, 0.850; March, 0.840; April, 0.820; May, 0.790; June, 0.780; July, 0.770; August, 0.770; September, 0.780; October, 0.800; November, 0.840; December, 0.850.

REMARKS.—September 19, 2.30 p. m., slight earthquake; October 1, feeble aurora.

C. F. B. WAPPENHANS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

INDIANOLA, TEX.

Location of office on December 31, 1884, Schultz Building, corner Main and Crockett streets.

[Latitude, 29° 23' N.; longitude 96° 31' W. Elevation of barometer above sea-level, 26 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 40 feet.]

Barometer readings (corrected for temperature and instrumental error only).																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Month.	Washington time.					Monthly mean.	Washington time.					Self-registering thermometers.					Precipitation.			Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	7 a. m.			11 p. m.			Highest.	Date.	Lowest.	Date.	Range.	7 a. m.			3 p. m.		11 p. m.		Monthly mean.	Maximum.	Date.		Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Maximum hourly velocity during month.	Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	In.	3 p. m.	11 p. m.	7 a. m.	3 p. m.							11 p. m.	7 a. m.	3 p. m.	11 p. m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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January.

April.

July.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—						River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Number of calms.								7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.		Fog.		Cloudy.		On which .01 inch or more precipitation fell.		Minimum below 32°.		Maximum above 90°.		Thunder-storms.		Highest.		Date.		Lowest.		Date.		Range.		Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					

* September.

† October.

‡ January.

North.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.42 a. m., 1.42 p. m., and 9.42 p. m., local time.

Corrections for instrumental error of barometer used: From 5.42 a. m., January 1, to 9.42 p. m., September 30, inclusive, — .024 inch; from 5.43 a. m., October 1, to 9.42 p. m., December 31, 1884, inclusive, + .006 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the months: January, 0.030; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

Remarks.—Frosts, January, 3, 9; April, 22; ice, January, 1, 2, 3, 5, 6, 7, 8, 20, 21, 24, 25; February, 13, 14, 15; March 1 in low places; December 13, 19, 23, 24, 31.

No maximum temperatures below 32°, and no auroras, during year.

ISAAC A. REED,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

JACKSONVILLE, FLA.

Location of office on December 31, 1884, Astor Building, corner Bay and Hogan streets.

[Latitude 30° 20' N.; longitude 81° 38' W. Elevation of barometer above sea-level, 43 feet. Elevation of exposed thermometer above ground, 37 feet. Elevation of rain-gauge above ground, 54 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.	Wind.				Total movement.						
Month.		Washington time.			Monthly mean.	Washington time.			Self-registering thermometer.			Mean maximum.	Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.								
		7 a. m.	3 p. m.	11 p. m.		Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.					Miles.	Direction from—										
																		Date.		Lowest.		Highest.	Range.	Date.			
1884.																											
Jan.....	30.207	30.148	30.202	30.186	30.534	21	29.689	8	865	46.4	58.6	50.1	51.7	72.2	31	21.0	6	51.2	61.0	43.1	4.78	1.61	24.25	28	N.	3,060	
Feb.....	30.106	30.038	30.007	30.087	30.306	11	29.644	28	656	56.4	69.4	60.5	62.1	79.0	13	38.8	29	42.2	71.7	54.5	2.45	.88	17.18	29	SW.	4,279	
Mar.....	30.075	30.014	30.000	30.070	30.349	16	29.762	28	597	61.1	73.5	64.2	66.8	83.5	25	42.4	1	42.8	75.3	58.8	2.63	1.58	13.14	25	SW.	5,958	
Apr.....	29.972	29.900	29.945	29.938	30.151	29	29.611	6	540	63.4	76.1	66.6	68.7	88.5	30	47.2	10	41.3	77.1	60.6	2.32	.93	5.6	38	W.	5,832	
May.....	29.985	29.934	29.973	29.944	30.184	3	29.746	27	438	73.1	83.2	73.3	76.5	90.7	25	62.3	31	28.4	85.2	69.3	5.45	2.02	29.32	25	SW.	5,053	
June.....	29.998	29.960	29.966	29.931	30.136	16	29.694	11	442	74.7	82.2	73.8	76.9	91.6	26	61.7	4	39.9	84.4	70.1	6.80	1.48	22.28	25	SW.	5,207	
July.....	29.973	29.926	29.959	29.953	30.113	23	29.793	16	320	80.0	88.6	80.0	82.9	95.9	9	69.2	9	28.7	90.6	75.9	6.02	2.65	16.28	25	SW.	5,500	
Aug.....	30.004	29.962	30.003	29.990	30.157	20	29.815	81	342	76.9	85.2	77.2	79.8	93.5	21	70.0	24	23.5	88.1	73.4	5.21	.90	8.24	25	N.E.	3,451	
Sept.....	30.035	29.990	30.038	30.024	30.246	20	29.801	10	405	73.9	83.5	76.0	77.8	91.7	12	64.2	17	24.9	81.9	70.7	5.68	2.32	4.5	21	N.E.	4,183	
Oct.....	30.075	30.023	30.066	30.054	30.327	20	29.847	9	480	68.6	79.3	70.6	72.8	91.7	7	49.4	25	42.8	80.6	65.6	4.12	1.99	12.18	22	N.	4,659	
Nov.....	30.082	30.028	30.069	30.060	30.251	6	29.659	28	592	56.0	69.1	60.1	61.7	73.8	4	39.0	25	89.8	70.5	54.1	5.43	3.75	27.28	26	N.E.	8,941	
Dec....	30.135	30.076	30.120	30.110	30.359	27	29.794	6	565	53.6	63.9	57.7	58.4	74.6	12	32.9	19	41.7	65.9	51.4	4.04	1.16	5.16	24	S. W.	4,285	
Sums.....	299.617	290.038	290.518	290.399	300.534	21	29.611	16	6,242	794.1	912.6	810.1	835.6	95.9	10	31.0	6	434.7	935.3	745.5	55.02	N.E.	55,428
Means.	30.083	30.003	30.043	30.063	30.534	21	29.611	16	520	63.3	76.0	67.5	69.6	95.9	10	31.0	6	36.2	77.9	69.2

† July.

† April.

• January.

REPORT OF THE CHIEF SIGNAL OFFICER.

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Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from--								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days--											
	Number of calm.								Washington time.		Washington time.		Washington time.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.			
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.										11 p. m.	Mean.	
1884.																										
Jan.....	18	5	4	4	10	11	15	16	42.2	45.3	44.4	44.2	87.2	62.9	81.7	77.3	5.1	7.7	3.9	4.9	0	0	0	1	0	
Feb.....	3	4	7	12	12	13	7	16	52.2	52.4	54.2	53.1	87.7	56.1	81.1	75.0	3.9	5.1	4.0	4.3	0	0	0	2	0	
Mar.....	5	13	5	13	15	19	12	7	56.3	55.2	57.1	56.2	87.4	54.6	79.4	72.9	4.1	5.6	2.9	4.3	0	0	0	2	0	
Apr.....	1	10	11	5	16	23	11	1	55.9	54.3	56.9	55.7	77.4	48.4	73.5	66.1	4.1	4.8	2.7	3.8	0	0	0	2	0	
May.....	0	18	17	13	18	23	11	3	67.1	64.8	66.7	66.2	82.1	55.6	80.6	72.8	3.2	5.4	2.7	4.1	0	0	0	2	0	
June.....	0	18	17	13	18	23	11	3	68.0	68.0	70.4	68.8	84.6	63.0	80.3	72.8	3.2	7.0	6.6	7.0	0	0	0	13	0	
July.....	7	25	6	12	16	17	5	2	74.4	71.9	74.5	73.6	83.2	61.0	83.0	76.0	4.4	7.1	5.1	5.1	0	0	0	20	0	
Aug.....	8	28	16	6	1	8	4	3	71.8	70.4	72.1	71.4	83.4	65.4	81.8	80.5	4.0	7.5	3.8	4.8	0	0	0	19	0	
Sept.....	14	39	14	3	0	4	2	5	64.7	64.4	65.5	64.9	87.8	61.6	84.8	82.2	3.4	6.2	3.2	5.2	0	0	0	18	0	
Oct.....	14	27	2	2	3	9	7	15	62.8	64.9	66.6	64.8	89.8	62.4	83.8	80.3	3.4	6.3	5.4	6.5	0	0	0	1	0	
Nov.....	25	15	1	2	10	9	3	17	61.5	56.4	54.8	53.9	92.8	75.4	90.3	80.2	5.9	6.9	6.0	6.2	0	0	0	1	0	
Dec.....	96	203	90	89	120	196	103	97	782.2	729.9	746.5	736.3	1038.8	732.6	1008.3	928.7	53.8	73.7	53.2	60.1	53	7	36	53	0	
Sums ..																									Percentages.	
Means ..	8.7 18.5 8.2 8.1 10.9 17.9 9.4 4.8 9.5								61.0° 60.8° 62.2° 61.3° 86.6° 61.0° 77.2° 4.5° 6.2° 4.4°		5.0 31.1 42.4 26.5 40.4 0 1.9 9.8 14.5 0		Percentages.													

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.42 a. m., 2.42 p. m., and 10.42 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, .000 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, .0050; February, .0050; March, .0050; April, .0040; May, .0040; June, .0040; July, .0040; August, .0040; September, .0040; October, .0040; November, .0050; December, .0050.

REMARKS.—From January 3 to 7, inclusive, freezing weather occurred. The temperature has never before fallen to freezing point so many consecutive days since the establishment of this station. Large quantities of fruits and vegetables were destroyed and many orange, lemon, lime, and other trees damaged.

J. W. SMITH

Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

KEOKUK, IOWA.

Location of office on December 31, 1884, State National Bank, corner of Second and Main streets.

[Latitude, 40° 22' N.; longitude, 91° 26' W. Elevation of barometer above sea-level, 618 feet. Elevation of exposed thermometer above ground, 47 feet. Elevation of rain-gauge above ground, 60 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	Washington time.					Monthly mean.					Highest.					Lowest.					Range.					Washington time.					Self-registering thermometers.					Mean maximum.		Mean minimum.		Total amount.		Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	7 P. M.		3 P. M.		11 P. M.	11 P. M.		Monthly mean.		Maximum.		Date.		Minimum.		Date.		Absolute range.		Mean maximum.		Mean minimum.		Total amount.		Largest amount.		Date.		Miles.		Direction.		Date.		Miles.		Direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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July.

March.

January.

Meteorological summary for the year ending December 31, 1884—Continued.

KEY WEST, FLA.

Location of office on December 31, 1884, Wall & Co.'s building, Front street, between Duval and Fitzpatrick streets.

[Latitude, 24° 34' N.; longitude, 81° 49' W. Elevation of barometer above sea-level, 20 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 43 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Mean maximum.		Mean minimum.		Any 3 consecutive 8-hourly measurements.		Total amount.	Direction from	Date.	Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	3 p.m.		11 p.m.		Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Largest amount.	Date.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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* One 7 a. m. observation missed.

† One 11 p. m. observation missed.

‡ January.

§ April.

|| August.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.								Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.								Mean.	11 p. m.	3 p. m.	7 a. m.	Mean.	Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 641 a. m., 241 p. m., and 1041 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1 to 11 p. m., December 31, 1884, inclusive, .000 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.020; February, 0.020; March, 0.020; April, 0.020; May, 0.020; June, 0.020; July, 0.020; August, 0.020; September, 0.020; October, 0.020; November, 0.020; December, 0.020.

RAZARATZ.—Barometer No. 235 used during the year. June 12, nine water-spots visible at the same time. August 23, three water-spots visible at the same time. No frost during the year. No snow fell during the year.

JAMES HARVEY SMITH,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

KITTY HAWK, N. C.

Location of office on December 31, 1884, Life-Saving Station No. 12.

[Latitude, 36° N.; longitude, 75° 42' W. Elevation of barometer above sea-level, 9 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 2 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Range.		Lowest.	Date.	Lowest.	Date.	Range.						Mean maximum.	Mean minimum.	Total amount.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In

* One 7 a. m., one 11 p. m., and one 8 p. m., observation not taken.

January.

April.

July.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—						Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—													
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.				7 a. m.		8 p. m.		11 p. m.		Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.	
								7 a. m.	8 p. m.	11 p. m.	Mean.																					
1884.																																
Jan.....	10	24	1	3	6	18	9	21	1	31.5	32.5	32.0	32.0	81.4	73.9	81.3	73.5	6.5	9	2	4	0	0	0	0	0	0	0	0	0	0	0
Feb.....	5	21	7	4	5	30	2	9	4	44.1	43.3	42.2	43.2	86.2	71.1	81.8	79.7	5.9	5	0	4	0	0	0	0	0	0	0	0	0	0	0
Mar.....	10	18	9	11	6	18	14	9	0	40.1	42.1	41.5	41.5	79.9	68.2	80.4	76.2	4.1	4	9	3	0	0	0	0	0	0	0	0	0	0	0
Apr.....	7	32	12	7	4	8	4	15	1	43.0	42.1	42.4	42.5	78.1	63.1	77.2	73.5	4.1	5	1	0	0	0	0	0	0	0	0	0	0	0	0
May.....	4	21	21	13	5	25	4	0	0	56.3	56.6	57.1	56.7	78.9	62.5	81.6	74.3	4.4	3	6	0	0	0	0	0	0	0	0	0	0	0	0
June.....	1	26	4	15	5	30	4	5	0	63.6	63.6	63.0	64.7	83.4	74.2	87.0	81.6	4.4	4	9	0	0	0	0	0	0	0	0	0	0	0	0
July.....	5	9	8	10	5	37	15	4	0	69.7	69.2	70.2	69.7	83.7	73.9	87.0	81.6	4.4	11	12	7	0	0	0	0	0	0	0	0	0	0	0
Aug.....	1	28	17	6	8	25	6	1	2	70.4	70.5	70.7	70.5	89.0	77.0	88.9	83.3	5.3	4	6	3	0	0	0	0	0	0	0	0	0	0	0
Sept.....	2	23	14	12	16	15	6	1	1	67.5	67.3	67.8	67.4	85.0	77.8	84.0	78.9	3.9	6	12	3	0	0	0	0	0	0	0	0	0	0	0
Oct.....	7	29	11	6	13	8	8	3	0	58.1	58.7	58.1	58.3	83.2	68.2	80.2	76.2	2.4	3	18	2	0	0	0	0	0	0	0	0	0	0	0
Nov.....	8	29	5	2	6	10	15	0	0	47.4	47.3	47.6	47.4	84.7	68.9	77.1	76.9	3.2	11	9	10	0	0	0	0	0	0	0	0	0	0	0
Dec.....	26	14	1	3	7	18	14	10	0	41.0	42.6	42.9	42.5	83.9	73.2	80.5	80.0	6.7	8	5	8	1	3	0	0	0	0	0	0	0	0	0
Sums ..	86	274	110	97	79	244	101	98	9	632.7	637.9	637.0	635.9	997.4	836.4	968.4	940.8	60.8	60.9	44.9	24	8	13	0	0	0	0	0	0	0	0	0
Means ..	7.825						7.222						7.222						35.0													
	10.0						9.2						9.1						6.6													
	Percentages.						Percentages.						Percentages.						Percentages.													

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.05 a. m., 3.05 p. m., and 11.05 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., March 18, inclusive, +.009 inch; from 7 a. m., March 19, to 11 p. m., December 31, 1884, inclusive, +.013 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.010; February, 0.010; March, 0.010; April, 0.010; May, 0.010; June, 0.010; July, 0.010; August, 0.010; September, 0.010; October, 0.010; November, 0.010; December, 0.010.

REMARKS.—Elevation of exposed wet bulb and maximum thermometer increased 1 foot, and minimum thermometer and rain-gauge increased 0.5 feet October 28. Elevation of barometer decreased 13 feet after 11 p. m. observation of October 31, in consequence of removal of office. Change of correction for instrumental error of barometer due to a change of instruments.

P. H. FITZMAURICE,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1894—Continued.

KNOXVILLE, TENN.

Location of office on December 31, 1894, Custom-house building, corner of Prince and Church streets.

[Latitude, 35° 56' N.; longitude 83° 59' W. Elevation of barometer above sea-level, 980 feet. Elevation of exposed thermometer above ground, 73 feet. Elevation of rain-gauge above ground, 77 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.					Monthly mean.	Self-registering thermometers.					Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Any 8 consecutive 3-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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	7 p. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.		Date.	Minimum.	Date.	Absolute range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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January.

April.

October.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).			Number of days—											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.			Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	
										7 a. m.	3 p. m.	11 p. m.															
1884.																											
Jan.....	14	21	3	3	2	16	22	8	22.0	24.1	24.6	23.6	86.8	67.2	82.6	72.9	6.3	9	11	14	14	8	23	0	0	0	
Feb.....	6	14	10	0	6	26	11	7	37.2	36.4	40.1	37.9	83.5	58.9	80.4	74.9	5.8	7	9	13	17	1	9	0	2	0	
Mar.....	9	21	9	3	2	22	16	3	37.4	38.1	40.8	38.8	82.2	57.5	75.2	71.6	5.6	7	13	13	16	0	0	0	5	0	
Apr.....	6	20	2	1	8	19	18	9	42.1	40.0	43.1	41.7	80.2	48.7	68.9	65.9	5.4	9	11	10	13	0	1	0	6	0	
May.....	16	18	19	0	2	17	19	5	54.8	51.9	54.5	53.7	84.0	45.9	70.4	60.8	3.2	11	13	10	13	0	0	0	7	0	
June.....	13	23	8	7	7	14	8	5	62.4	60.8	64.1	62.4	88.2	55.8	83.2	75.7	3.2	11	17	10	12	0	0	0	14	0	
July.....	8	14	1	0	7	33	14	4	66.6	64.3	67.5	66.1	90.5	56.6	85.4	77.5	3.3	9	16	4	9	0	0	2	7	0	
Aug.....	13	25	5	8	2	14	9	5	63.5	61.3	64.8	63.2	90.5	50.2	81.3	74.0	4.6	14	13	4	9	0	0	3	11	0	
Sept.....	11	32	9	3	5	13	5	1	60.7	58.0	63.2	60.6	88.7	44.3	80.5	71.2	3.7	12	16	2	3	0	0	1	7	0	
Oct.....	18	20	8	10	4	7	9	3	52.7	50.0	53.3	52.0	89.0	43.2	74.8	69.0	4.1	23	13	5	5	0	1	7	1	0	
Nov.....	9	19	7	6	5	9	8	5	35.0	33.0	37.3	35.8	88.3	47.2	78.3	71.3	3.4	18	7	3	3	0	0	1	0	0	
Dec.....	15	18	13	8	3	11	15	5	31.2	33.4	36.3	32.8	86.6	61.4	78.4	75.5	6.7	6	13	12	12	2	14	0	1	0	
Sums ..	138	245	79	44	53	201	154	60	565.6	553.3	585.6	568.1	1040.5	630.9	939.4	872.3	59.1	124	147	95	143	11	64	19	56	0	
Means ..	Percentages.																										
	12.6	22.3	7.2	4.0	4.8	18.3	14.0	5.5	47.1	46.1	48.8	47.3	86.7	53.1	78.3	72.7	4.9	33.9	40.2	26.0	39.1	3.0	17.5	5.5	21.5	3.0	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.32 a. m., 2.32 p. m., and 10.32 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.023 inch.
The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.080; February, 1.080; March, 1.060;
April, 1.040; May, 1.020; June, 1.010; July, 1.000; August, 1.010; September, 1.020; October, 1.040; November, 1.070; December, 1.080.

REMARKS.—Destructive hail-storm March 25. Earthquake shock August 24.

JNO. A. CODY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

L. A. CROSSE, WIS.

Location of office on December 31, 1884, Opera House.

[Latitude, 49° 49' N.; longitude, 91° 15' W. Elevation of barometer above sea-level, 725 feet. Elevation of exposed thermometer above ground, 46 feet. Elevation of rain-gauge above ground, 67 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Washington time.					Monthly mean.					Self-registering thermometers.					Any 8 consecutive 8-hourly measurements.					Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	7 p. m.	3 p. m.	11 p. m.	Range.	Date.	Highest.	Lowest.	Date.	Range.	In.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.		Direction from—		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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* One 11 p. m. observation taken late.

† December.

‡ March.

§ July.

|| January.

Meteorological summary for the year ending December 31, 1884—Continued.

LEAVENWORTH, KANS.

Location of office on December 31, 1884, No. 315 Delaware street.

[Latitude, 39° 19' N.; longitude, 94° 37' W. Elevation of barometer above sea level, 843 feet. Elevation of exposed thermometer above ground, 25 feet. Elevation of rain gauge above ground, 48 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.				Monthly mean.			Date.			Range.			Washington time.				Self-registering thermometers.			Mean maximum.			Mean minimum.				Total amount.		Any 3 consecutive 8-hourly measure-ments.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	7 a. m.		3 p. m.		11 p. m.		In.			Lowest.			Date.			In.			7 a. m.		3 p. m.		11 p. m.		Monthly mean.			Maximum.		Date.		Absolute range.		Minimum.		Date.		Mean maximum.		Mean minimum.		Total amount.		Largest amount.		Date.		Direction from—		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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• January.

† March.

‡ July.

[illegible]

*** February, four days only; December, seventeen days.**

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.48 a. m., 1.48 p. m., and 9.48 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.017 inob.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: **January, 0.900; February, 0.900; March, 0.940; April,**

May, 0.880; June, 0.870; July, 0.860; August, 0.860; September, 0.880; October, 0.900; November, 0.940; December, 0.900.

October 31.

CHARLES DILL,
Sergeant Signal Corps, 17 & 1

Meteorological summary for the year ending December 31, 1884—Continued.

LEWISTON, IDAHO.

Location of office on December 31, 1884, corner Montgomery and Fourth streets.

[Latitude, 40° 8' N., longitude, 117° 5' W. Elevation of barometer above sea-level, 780 (B) feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 38 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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• January.

† March.

‡ August.

§ February.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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NOTE.—7 a. m., 3 p. m., and 11 p. m.; Washington time, correspond to 4.20 a. m., 12.20 p. m., and 8.20 p. m., local time.
 Correction for instrumental error of barometer used: From 7 a. m. January 1, to 11 p. m., December 31, 1884, inclusive, + .004 inch.
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.870; February, 0.870; March, 0.880; April, 0.880; May, 0.840; June, 0.820; July, 0.810; August, 0.810; September, 0.830; October, 0.830; November, 0.870; December, 0.880.

C. E. BUTLER,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

LITTLE ROCK, ARK.

Location of office on December 31, 1884, Standard Bank Building.

[Latitude, 34° 45' N.; longitude, 92° 0' W. Elevation of barometer above sea-level, 299 feet. Elevation of exposed thermometer above ground, 26 feet. Elevation of rain-gauge above ground, 53 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).							Temperature.										Precipitation.			Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.				Monthly mean.			Washington time.		Self-registering thermometers.						Total amount.		Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	7 a. m.			11 p. m.	In.	Date.	Lowest.	Date.	Range.	7 a. m.		11 p. m.		Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.		Lat. Feet amount.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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January.

April.

July.

Meteorological summary for the year ending December 31, 1884—Continued.

LOS ANGELES, CAL.

Location of office on December 31, 1884, Baker Block, No. 242 Main street.

[Latitude 34° 8' N.; longitude, 118° 15' W. Elevation of barometer above sea-level, 871 feet. Elevation of exposed thermometer above ground, 57 feet. Elevation of rain-gauge above ground, 107 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.	
	Washington time.			Monthly mean.			Washington time.				Self-registering thermometers.				Mean maximum.		Mean minimum.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.				
	7 a. m.	3 p. m.	11 p. m.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Total amount.	Last 8-hourly amount.	Date.	Miles.	Direction from—					
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.				
Jan.....	29.741	29.752	29.742	29.745	30.095	129.449	25.	.640	46.9	62.9	52.0	53.9	73.0	12	33.7	17	44.3	64.4	42.9	3.15	1.36	37.28	24	{SW...}	{28}	5.166	
Feb.....	29.613	29.671	29.676	29.653	29.660	19.29	183	6.	.697	49.7	61.8	53.8	55.1	81.0	24	38.5	9	42.5	63.7	47.1	13.37	3.63	1.2	40	W.	17	5.483
Mar.....	29.613	29.655	29.633	29.634	29.618	8.29	451	8.	.867	48.9	61.7	53.8	54.8	72.5	1	37.0	27	85.5	63.5	47.4	12.36	3.18	3.4	30	NW.	10	5.681
Apr.....	29.627	29.647	29.627	29.634	29.636	129.405	27.	.431	50.4	66.0	55.3	57.2	80.0	20	41.5	1	38.5	68.4	49.1	3.58	2.20	9.10	24	{SW...}	{10}	4.512	
May.....	29.614	29.614	29.606	29.611	29.730	10.29	406	18.	.264	55.4	70.6	58.9	61.6	79.0	26	47.0	2	32.0	72.7	54.3	.89	.22	19.20	18	W.	26	4.028
June.....	29.556	29.585	29.565	29.569	29.721	14.29	398	25.	.328	58.0	75.3	63.4	65.6	96.0	30	49.5	14	48.5	78.1	57.0	1.89	.87	12.13	20	{S...}	{12}	3.883
July.....	29.570	29.587	29.563	29.573	29.697	18.29	451	1.	.246	56.7	84.5	66.3	70.2	99.0	1	51.5	16	47.5	86.9	58.6	.03	.01	8.80	18	W.	14	3.194
Aug.....	29.546	29.561	29.543	29.551	29.698	4.29	456	6.	.242	61.8	84.7	67.4	71.3	101.5	29	52.5	28	49.0	87.0	60.0	.02	.01	26.28	20	W.	28	3.695
Sept.....	29.560	29.576	29.553	29.563	29.710	15.29	327	29.	.883	56.7	77.1	62.6	65.5	92.5	21	45.5	17	47.0	79.9	54.1	.39	.17	12.13	18	W.	21	3.583
Oct.....	29.592	29.606	29.590	29.599	29.768	27.29	806	1.	.482	54.1	72.6	63.1	62.3	89.1	22	43.9	7	46.2	74.8	51.2	.39	.17	12.13	24	NW.	2	3.707
Nov.....	29.604	29.602	29.603	29.603	29.779	24.29	437	21.	.842	51.2	70.7	56.9	59.6	88.0	7	38.7	27	49.3	73.2	48.0	1.07	1.01	12.13	14	{SW...}	{10}	3.284
Dec.....	29.615	29.631	29.619	29.618	29.904	31.29	236	12.	.668	46.8	58.9	51.1	52.8	75.6	1	35.5	2	40.1	61.4	44.3	4.65	3.04	25.26	34	NE.	8	4.385
Summ. Mean	29.613	29.655	29.633	29.634	29.660	129.449	25.	.640	46.9	62.9	52.0	53.9	73.0	12	33.7	17	44.3	64.4	42.9	3.15	1.36	37.28	24	{SW...}	{28}	5.166	
W. Mean	29.613	29.655	29.633	29.634	29.660	129.449	25.	.640	46.9	62.9	52.0	53.9	73.0	12	33.7	17	44.3	64.4	42.9	3.15	1.36	37.28	24	{SW...}	{28}	5.166	

(—) Dash indicates precipitation inappreciable

(One 7 a. m. observation missed)

1 January.

4 February.

8 August.

* (—) Dash indicates precipitation inappreciable.

One 7 a. m. observation missed.

January.

February.

August.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																															
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																						
										7 a. m.	3 p. m.	11 p. m.	Mean.																																								
1894.																																																					
Jan.....	5	27	18	9	6	8	9	4	4	35.2	43.9	41.7	38.4	67.9	47.0	70.7	61.9	3.2	4.4	3.0	3.5	17	8	6	5	0	0	0	0	0	0																						
Feb.....	1	25	21	7	4	11	6	2	2	42.4	43.9	41.7	44.0	78.4	57.8	77.0	71.1	5.1	5.9	3.9	3.2	17	8	10	14	0	0	0	0	0	0																						
Mar.....	7	20	13	4	14	14	16	9	3	44.3	47.0	48.0	46.4	84.7	61.6	81.6	76.0	5.4	7.0	3.9	3.9	9	11	11	18	0	0	0	0	0	0																						
Apr.....	0	15	11	2	12	24	9	3	4	51.7	51.0	51.0	50.6	80.6	62.2	85.4	79.4	4.9	5.8	2.9	4.5	9	11	13	19	0	0	0	0	0	0																						
MAY.....	0	6	3	3	14	18	43	4	2	51.7	55.2	53.1	53.3	87.9	59.0	81.3	76.1	6.6	6.1	3.6	5.1	7	16	8	8	0	0	0	0	0	0																						
June.....	0	10	4	0	5	9	56	1	5	54.2	57.4	56.7	56.7	87.6	57.7	81.3	75.5	6.9	5.5	4.9	5.8	8	13	6	6	0	0	0	0	0	0																						
July.....	0	10	1	2	1	16	47	0	16	56.6	62.8	60.1	59.5	89.5	47.1	80.6	72.4	2.5	2.2	.6	.6	12	7	0	0	0	0	0	0	0	0																						
Aug.....	1	13	2	0	4	16	49	0	8	57.5	61.7	57.4	55.1	87.0	49.0	81.8	72.5	1.7	1.4	1.5	1.2	23	7	0	0	0	0	0	0	0	0																						
Sept.....	2	14	1	1	6	11	35	3	12	48.3	57.1	53.3	51.1	83.2	52.0	83.4	72.5	2.7	3.0	1.5	2.4	20	8	2	2	0	0	0	0	0	0																						
Oct.....	5	19	0	1	7	11	35	4	10	48.3	57.1	53.3	51.1	83.2	52.0	83.4	72.5	1.1	1.9	1.0	1.3	25	4	2	2	0	0	0	0	0	0																						
Nov.....	1	25	6	3	9	7	28	4	11	44.9	49.5	50.8	48.4	81.4	63.5	82.7	71.2	2.8	2.0	1.4	3.9	31	7	6	10	0	0	0	0	0	0																						
Dec.....	2	27	14	9	5	1	16	7	10	42.3	45.2	45.7	44.4	83.8	63.5	82.7	77.2	3.0	4.7	2.8	3.8	13	11	6	13	0	0	0	0	0	0																						
Sums ..	24	211	94	41	82	132	385	47	81	576.0	632.2	625.4	607.9	1005.7	659.1	968.1	877.7	44.4	47.9	33.4	41.5	189	110	96	71		0	0	15	5	0																						
										Percentages.				Percentages.								Percentages.																															
Means .	2, 219, 2, 8, 3, 7, 5, 12, 0, 35, 1, 4, 3, 7, 4									51.8				83.8				4.0				3.5				51.8				30.1				18.1				19.4				0				0				4, 1, 1, 4, 0			

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.15 a. m., 12.15 p. m., and 8.15 p. m., local time.

Correction for instrumental error of barometer used: From 1.50 a.m. to 8.15 p.m., December 31, 1984, inclusive, + 0.11 inoh. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.400; February, 0.400; March, 0.400; April, 0.400; May, 0.400; June, 0.390; July, 0.390; August, 0.390; September, 0.390; October, 0.400; November, 0.400; December, 0.400.

REMARKS.—January 4, slight shock of earthquake felt; heavy frosts during month. February 6, hail fell; solar halo on 26th and 27th; frosts on 8th, 9th, and 13th. March 21, solar halo; lunar halo, 13th; frosts on 11th, 24th, 25th, and 27th. April 1, 4, and 5, lunar halos. Frequent fogs during month of May. June 16, slight shock of earthquake. Frequent fogs during month of May. July 7, polar bands; remarkably red appearance of sky after sunset during the month. August 2, 3, and 15, polar bands; lunar halo, 28th; red sunsets noted during month. September, remarkably brilliant red sunset; observed during the month. October 22, slight shock of earthquake; lunar halo, 28th; red sunsets during month. November 4, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, lunar halo; red sunsets noted frequently during month. December 3, first frost of the season; frost on 3d, 6th, 13th, 14th, 15th, 16th, and 17th; red sunsets noted during the month; lunar corona 31st.

GEORGE E. FRANKLIN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

LOUISVILLE, KY.

Location of office on December 31, 1884, corner Fourth and Green streets.

[Latitude, 39° 19' N.; longitude, 89° 49' W. Elevation of barometer above sea-level, 530 feet. Elevation of exposed thermometer above ground, 89 feet. Elevation of rain-gauge above ground, 102 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Washington time.			Monthly mean.	Highest.	Lowest.	Range.	Washington time.			Self-registering thermometers.			Mean maximum.	Mean minimum.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.	Prevailing direction.	Miles.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	7 a.m.	3 p.m.	11 p.m.					Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.			Largest amount.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

* Thirty and two third days.

† January.

‡ April.

§ June.

[illegible]

* February.

† September.

1 October.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.25 a. m., 2.25 p. m., and 10.25 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .020 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.590; February, 0.590; March, 0.590; April, 0.590; May, 0.550; June 0.550; July, 0.550; August, 0.550; September, 0.550; October, 0.570; November, 0.590; December, 0.600.

River above danger line from February 4, 9:25 p. m., to February 25, 1:25 p. m.
 REMARKS.—January 5 coldest day recorded at station; minimum, -19.5°. February 15 and 16 river reached 46 feet 7 inches, this being the highest water ever observed at this station. January 6, 0.500; July, 0.500; August, 0.500; September, 0.500; October, 0.510; November, 0.500; December, 0.499.

E. B. GARRISON,
Sergeant, Signal Corps, U. S. A.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Number of calms.								7 a. m.				3 p. m.				11 p. m.				Mean.				Clear.	Fair.	Cloudy.	On which 0.1 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.	Thunder-storms.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.52 a. m., 2.52 p. m., and 10.52 p. m., local time.

Correction for instrumental error of barometer used: From 6.52 a. m., January 1, to 10.52 p. m., December 31, 1884, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.720; February, 0.720; March, 0.720; April, 0.710; May, 0.680; June, 0.670; July, 0.670; August, 0.670; September, 0.680; October, 0.690; November, 0.720; December, 0.730.

REMARKS.—Last frost of season, April 12; polar bands observed p. m., May 20; a brilliant meteor observed at 9.04 p. m., June 23; first light frost of season, October 16; first killing frost and ice, October 24; first snow of season, November 20.

JNO. HEALY
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MACKINAW CITY, MICH.

Location of office on December 31, 1884, corner Huron avenue and E street.

[Latitude, 45° 47' N.; longitude, 84° 39' W. Elevation of barometer above sea-level, 605 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 34 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8-hourly measure ments.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	7 a. m.		3 p. m.		Monthly mean.	Date.	Lowest.	Date.	Range.	In.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.		Jn.	Jn.	Jn.		Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.	Jn.

January.

March.

August.

March.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).	Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	Number of calms.											Washington time.					Clear.	Fair.	Cloud.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.				7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.										3 p. m.	11 p. m.	Mean.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.30 a. m., 2.30 p. m., and 10.30 p. m. local time.

Correction for instrumental error of barometer used: From 1 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.008 inch.

The barometric observations may be reduced to sea level by adding the following constants for the various months: January 0.700; February, 0.700; March, 0.700; April, 0.680; May, 0.650; June, 0.640; July, 0.640; August, 0.640; September, 0.650; October, 0.670; November, 0.690; December, 0.700.

D. B. NOTSON
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MACON, FORT, N. C.

Location of office on December 31, 1884, Hospital Building.

[Latitude, 34° 42' N.; longitude, 76° 40' W. Elevation of barometer above sea-level, 11 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 5 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8 hourly measurements.					Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	7 a. m.		3 p. m.		11 p. m.		Month & mean.		Date.		Lowest.		Range.		7 a. m.		3 p. m.		11 p. m.		Monthly		Maximum.		Date.		Minimum.			Date.		Absolute		Mean maximum.		Total amount.		Largest amount.		Date.		Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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* January.

† April.

‡ July.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from--								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days--																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Number of calms.								7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Jan.	20	13	0	4	6	23	9	18	0	34.0	35.8	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.02 a. m., 3.02 p. m., and 11.02 p. m., local time.
Correction for instrumental error of barometer used: From 7.02 a. m., January 1, to 11.02 p. m., December 31, 1884, inclusive, +.015 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.010; February, 0.010; March, 0.010; April, 0.010; May, 0.010; June, 0.010; July, 0.010; August, 0.010; September, 0.010; October, 0.010; November, 0.010; December, 0.010.

REMARKS.—January 6, coldest day in twenty years. March, last frost, 16th. December, first light frost, 10th; first killing frost, 18th.

WILLIAM DALY
Frisco, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MAGINNIS, FORT, MONT.

Location of office on December 31, 1884, Post Quarters.

[Latitude, 47° 15' N.; longitude, 109° 10' W. Elevation of barometer above sea-level, 4,340 (B) feet. Elevation of exposed thermometer above ground, 8 feet. Elevation of rain-gauge above ground, 22 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.							Precipitation.				Wind.				Total movement.				
	Washington time.					Monthly mean.					Self-registering thermometers.							Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.								
	7 P. M.		3 P. M.		11 P. M.	Highest.	Lowest.	Date.	Range.	Washington time.			Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Date.	Miles.	Direction from—	Date.		Miles.			
	In.	Th.	In.	Th.						7 P. M.	3 P. M.	11 P. M.																		
1884.																														
Jan.	25.576	25.541	25.529	25.549	25.597	In.	8	25.139	26	.758	17.3	25.1	20.8	21.148.1	12	20.3	4	68.4	23.1	12	0	1.47	22	9	53	SW.	11	W.	10,692	
Feb.	25.445	25.420	25.444	25.416	25.436	25.893	15	25.038	15	.855	4.5	14.4	9.0	21.148.1	24	28.5	11	79.2	18.8	18.8	0	69	18	27	38	SW.	22	NW.	7,801	
Mar.	25.457	25.409	25.470	25.465	25.838	12	24.903	10	.955	25.3	82.9	24.3	24.3	26.553.1	24	14.1	7	67.2	34.6	18.9	0	55	16	27	52	NW.	10	W.	6,574	
Apr.	25.516	25.496	25.510	25.507	25.868	18	25.108	12	.760	30.6	43.2	33.9	33.9	30.653.8	23	16.9	27	48.9	43.7	27.9	0	62	14	7	52	NW.	18	NW.	6,566	
May	25.569	25.533	25.575	25.566	25.833	30	25.205	3	.628	44.1	61.3	46.3	46.3	50.678.4	25	39.6	12	48.8	62.7	69.9	0	76	23	28	29	40	NW.	9	SW.	7,425
June	25.567	25.536	25.547	25.550	25.800	18	25.380	10	.420	53.8	69.4	57.6	57.6	60.387.6	20	43.4	27	44.2	71.8	30.4	0	1.21	84	23	44	SE.	23	SW.	6,456	
July	25.603	25.569	25.580	25.584	25.734	18	25.376	31	.348	62.2	68.8	54.9	54.9	58.661.3	31	37.0	5	44.3	71.6	49.7	0	64	19	21	23	52	NW.	31	SW.	7,269
Aug.	25.652	25.619	25.644	25.638	25.832	5	25.365	1	.467	53.8	72.0	54.6	54.6	60.886.9	10	36.0	20	52.9	74.5	51.8	0	1.33	54	1	48	NW.	1	SW.	6,740	
Sept.	25.517	25.487	25.498	25.501	25.770	19	25.248	2	.522	40.2	56.1	44.1	44.1	47.778.2	20	25.7	30	53.1	57.4	38.2	0	26	14	7	8	40	NW.	27	W.	7,422
Oct.	25.550	25.529	25.554	25.544	25.836	16	25.201	1	.785	34.0	53.9	41.1	41.1	43.076.2	13	20.3	29	55.9	55.9	32.2	0	33	10	23	46	NW.	28	NE.	9,229	
Nov.	25.623	25.599	25.599	25.607	25.828	4	25.342	24	.480	30.1	45.4	38.0	37.2	37.269.8	7	5.0	22	74.8	48.0	27.6	0	31	21	21	56	NW.	28	NW.	9,780	
Dec.	25.517	25.493	25.515	25.505	25.868	9	25.057	19	.836	32.2	10.9	4.1	4.1	5.768.4	1	30.0	22	98.4	13.0	—	0	82	30	6	48	W.	3	W.	7,280	
Sum.	25.592	25.560	25.572	25.562	25.800	18	25.380	10	.420	53.8	69.4	57.6	57.6	60.387.6	20	43.4	27	44.2	71.8	30.4	0	9.00								93,104
Means	25.549	25.525	25.539	25.538	25.832	16	25.342	24	.480	30.1	45.4	38.0	37.2	37.269.8	7	5.0	22	74.8	48.0	27.6	0	82	30	6	48	W.				93,104

§ December.

§ August.

§ March.

• October.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calm.	Dew-point.			Relative humidity (per cent.).			Cloudiness (in tenths).			Number of days—										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.			Mean.			Clear.	Fair.	Cloudy.	On which precipitation fell.	Maximum below 82°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.					
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.										11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.
1884.																													
Jan.....	5	18	1	1	0	18	26	23	1	3.4	7.2	5.2	5.3	54.6	48.5	51.4	51.5	3	6.9	5.4	2	0	0	0					
Feb.....	17	17	4	8	2	12	14	18	0	8.6	1.8	6.0	5.8	51.6	49.1	50.1	50.3	5	7.0	4.3	6	0	0	0					
Mar.....	2	16	10	10	0	11	29	15	0	7.6	13.1	8.1	9.6	52.9	44.8	48.8	49.2	5	5.4	5.3	0	0	0	0					
Apr.....	0	18	5	12	0	5	24	26	0	14.4	23.5	16.5	18.1	50.9	43.9	48.5	47.8	5	5.7	4.2	0	0	0	0					
May.....	4	18	0	8	3	23	20	17	0	25.8	39.3	29.9	31.7	49.7	47.9	53.9	50.4	4	4.6	4.4	0	0	0	0					
June.....	0	17	3	6	7	31	18	13	0	38.7	44.4	40.9	40.7	53.9	44.4	54.3	51.5	3	5.9	4.4	0	0	0	0					
July.....	0	13	6	13	3	27	18	13	0	39.4	44.4	41.6	41.8	62.7	44.1	62.2	56.3	0	10	5	0	0	0	0					
Aug.....	0	8	0	10	10	29	18	18	0	42.1	46.9	43.2	44.1	65.7	45.3	62.1	57.7	4	10	4	0	0	0	0					
Sept.....	1	21	2	3	0	5	30	28	0	26.2	37.6	30.6	31.5	58.6	51.4	58.2	55.4	7	7.2	5.0	0	0	0	0					
Oct.....	3	26	1	2	0	14	24	23	0	21.0	31.2	23.1	28.4	58.7	46.5	51.1	53.1	0	4.7	3.7	0	0	0	0					
Nov.....	6	13	1	5	0	5	30	30	0	16.9	26.1	19.7	20.9	57.2	47.7	51.4	52.1	6	3.7	3.1	0	0	0	0					
Dec.....	1	32	8	1	1	3	33	14	0	10.6	3.2	8.7	7.5	58.7	52.3	54.9	53.6	5	6.1	5.9	0	0	0	0					
Sums.....	39	217	41	74	26	183	284	233	1	213.3	310.7	246.1	254.8	668.2	565.7	632.9	628.9	54.0	66.3	56.7	0	20	4	4					
Means.....	Percentages.									17.8	25.9	20.5	21.4	55.7	47.1	54.4	52.4	4.7	5.5	4.7	5.0	31.9	36.3	29.8	35.0	18.3	50.8	0.5	51.1

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4 53 a. m., 12 52 p. m., and 8 52 p. m., local time.

Correction for instrumental error of barometer used: From 4.32 a. m., January 1, to 8.32 p. m., December 31, 1884, inclusive, + .009 inch.

The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 4.77; February, 4.75; March, 4.60; April, 4.50; May, 4.41; June, 4.33; July, 4.31; August, 4.31; September, 4.40; October, 4.54; November, 4.60; December, 4.63.

REMARKS.—Auroras, February 19, June 18, July 25, and September 17; mirages, February 15 and 17; killing frost, July 5.

FRANK BUREK,
Private, Signal Corps U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MARQUETTE, MICH.

Location of office on December 31, 1884, corner Spring and Front streets.

[Latitude, 46° 34' N.; longitude, 87° 24' W. Elevation of barometer above sea-level, 673 feet. Elevation of exposed thermometer above ground, 36 feet. Elevation of rain-gauge above ground, 57 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement.		
	Washington time.					Range.					Washington time.					Self-registering thermometers.					Any consecutive 3-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.			
	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—			Date.	Miles.
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.	
Jan.....	29.335	29.301	29.325	29.323	29.862	26	28.559	30	1.333	7.4	15.3	9.9	10.944.5	17—19.0	24	63.5	20.0	—0.5	.91	.29	13	32	NW.	3	W.	13	32	NW.	7,067
Feb.....	29.327	29.309	29.312	29.316	29.847	10	28.690	19	1.157	6.6	14.9	8.9	10.138.8	19—20.0	15	58.8	20.3	—3.0	2.05	.48	12	34	S.	19	NW.	13	34	NW.	5,597
Mar.....	29.298	29.272	29.290	29.287	29.764	30	28.346	11	1.418	17.2	28.9	22.0	22.758.0	24—16.0	1	72.0	32.0	9.1	.74	.35	10	11	N.	28	N.	28	36	NW.	5,346
Apr.....	29.308	29.280	29.296	29.291	29.905	21	28.592	27	1.313	33.0	39.5	34.3	35.680.0	26.17.9	1	51.1	42.9	25.3	3.94	1.96	14	15	NW.	27	NW.	14	15	NW.	6,419
May.....	29.224	29.213	29.216	29.218	29.717	28	28.827	18	.890	45.7	51.1	44.8	47.272.5	30.31.2	2	41.3	54.6	37.8	2.43	.68	18	19	NW.	10	NW.	10	19	NW.	5,845
June.....	29.859	29.329	29.323	29.337	29.681	14	29.052	7	.629	57.2	64.1	57.7	59.791.0	29.37.4	10	53.6	71.1	48.1	1.21	.40	1	24	NW.	11	N.	11	24	NW.	8,974
July.....	29.167	29.173	29.165	29.168	29.440	7	28.695	5	.745	58.4	63.9	57.5	59.990.0	22.43.1	8	42.9	68.2	51.9	2.45	.63	5	28	NW.	5	W.	5	28	NW.	4,826
Aug.....	29.258	29.242	29.242	29.247	29.625	9	28.873	8	.752	60.0	68.2	60.8	63.090.0	20.38.6	8	51.2	73.0	53.9	5.46	2.28	29	26	NW.	4	NW.	29	26	NW.	5,804
Sept.....	29.207	29.199	29.210	29.208	29.776	13	28.665	24	1.111	54.4	65.2	57.9	59.888.8	6.38.0	22	60.8	60.5	51.8	4.91	1.69	23	24	SE.	27	SW.	23	24	SE.	6,769
Oct.....	29.290	29.273	29.291	29.284	29.831	14	28.746	6	1.085	44.6	62.3	45.8	47.682.0	19.20.3	23	61.7	54.7	38.2	5.92	6.00	24	25	SW.	16	SW.	24	25	SW.	8,110
Nov.....	29.276	29.247	29.276	29.266	29.644	17	28.742	29	.902	38.6	35.2	30.3	31.364.0	14—15.9	17	70.3	38.3	22.7	2.77	1.14	22	23	SW.	6	W.	23	24	SW.	8,390
Dec.....	29.298	29.298	29.298	29.293	29.866	25	28.787	7	1.079	19.1	22.7	19.4	20.477.0	8.4	15.9	62.9	26.8	11.4	8.65	2.18	6	7	NW.	8	W.	7	8	NW.	7,131
Sum.....	351,845	351,120	351,243	351,240	.....	.....	.....	.....	12,414	134.2	821.8	449.2	468.2	.....	.....	680.1	573.4	946.7	441.44	.....	.....	.....	.....	.....	.....	.....	.....	.....	75,198
Means.....	29.276	29.262	29.270	29.270	29.905	121	28.846	11	1.034	84.2	43.4	37.4	39.091.0	220—20.0	115	54.7	47.8	28.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
* One 11 p. m. observation missed.																													
† April.																													
‡ March.																													
§ June.																													
¶ February.																													

* One 11 p. m. observation missed.

† April.

‡ March.

§ June.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew point.				Relative humidity (per cent.)				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Number of calm.								Washington time.				Mean.				Mean.				Fair.				Cloudy.		On more precipitation fall.		Maximum below 32°.		Minimum below 32°.		Maximum above 30°.		Thunder-storms.		Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Cloudy.	On more precipitation fall.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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NOTE.—7 a. m., 3 p. m., and 11 p. m.; Washington time, correspond to 6.19 a. m., 2.19 p. m., and 10.19 p. m., local time.

Correction for instrumental error of barometer used: From 6.19 a. m., January 1, to 10.19 p. m., December 31, 1884, inclusive, +.004 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.780; February, 0.780; March, 0.770; April, 0.760; May, 0.720; June, 0.720; July, 0.710; August, 0.710; September, 0.720; October, 0.740; November, 0.770; December, 0.780.

F. M. NEAL,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MEMPHIS, TENN.

Location of office on December 31, 1884, No. 260 Front street.

[Latitude, 35° 9' N.; longitude, 90° 3' W. Elevation of barometer above sea-level, 321 feet. Elevation of exposed thermometer above ground, 53 feet. Elevation of rain-gauge above ground, 51 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.								
	Washington time.					Washington time.					Self-registering thermometers.						Any 3 consecutive 8-hourly measure ments.		Maximum hourly velocity during month.								
	7 p. m.	9 p. m.	11 p. m.	Monthly mean.	Range.	Date.	Lowest.	Highest.	Monthly mean.	Date.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Latest amount.	Date.	Miles.	Direction.	Date.	Prevailing direction.	Total movement.			
1884.																											
Jan.	29.924	29.879	29.921	29.908	30.422	5	29.411	31	1.011	28.4	37.4	33.3	33.0	71.0	30	-2.0	6	73.0	41.2	25.0	5.66	1.23	7	28	NW.	SE.	5.156
Feb.	29.742	29.689	29.733	29.721	30.167	15	29.190	19	.977	43.5	52.3	47.7	47.8	72.7	4	18.5	14	54.2	57.1	39.6	9.64	2.41	6	32	W.	SE.	4.462
Mar.	29.691	29.680	29.671	29.674	30.078	9	29.282	25	.796	47.6	57.2	52.8	52.5	75.0	28	26.8	2	48.2	61.1	45.1	5.08	1.29	4	30	W.	SE.	4.550
Apr.	29.622	29.604	29.605	29.610	29.900	8	29.116	14	.784	54.8	64.7	59.1	58.5	83.0	30	40.5	11	42.5	68.0	51.8	8.60	3.02	14	22	NW.	W.	4.067
May*	29.607	29.641	29.650	29.653	29.873	2	29.403	5	.470	64.3	76.3	68.2	68.6	96.8	11	54.0	30	32.8	78.4	61.2	6.46	2.72	21	22	SE.	S.	3.889
June.	29.671	29.643	29.658	29.657	29.858	17	29.452	9	.406	71.5	81.6	73.5	75.5	94.0	22	59.0	10	37.0	84.1	68.8	7.26	3.85	2	28	NW.	SE.	2.716
July.	29.651	29.622	29.634	29.636	29.791	21	29.419	9	.872	77.2	88.3	80.0	81.8	96.5	9	70.0	12	24.5	90.7	73.9	2.38	.76	28	30	NW.	NW.	3.523
Aug.	29.741	29.723	29.734	29.733	29.866	9	29.445	29	.421	72.7	84.8	75.9	77.8	97.0	29	62.0	11	35.0	86.9	70.4	1.27	.75	29	19	NW.	NW.	3.567
Sept.	29.744	29.722	29.738	29.735	29.905	15	29.438	23	.417	70.4	84.5	75.8	76.9	94.0	9	61.0	19	33.0	88.3	69.2	4.29	1.07	24	25	SE.	SE.	3.245
Oct.	29.830	29.804	29.828	29.821	30.134	23	29.606	26	.828	59.9	74.1	65.0	66.3	92.0	1	38.0	24	56.0	75.5	58.0	2.63	1.47	26	27	NW.	NW.	3.620
Nov.	29.834	29.800	29.812	29.815	30.243	6	29.249	22	.994	44.5	58.3	50.8	51.2	71.2	2	23.7	24	47.5	81.0	41.4	2.08	1.94	22	28	NW.	W.	3.815
Dec.	29.790	29.753	29.790	29.778	30.235	19	29.254	5	.981	37.5	44.6	41.9	41.8	93.1	4	8.1	19	60.0	49.4	32.5	9.14	3.12	29	30	NW.	SE.	5.459
Sums.	356.907	356.540	356.774	356.741	.....	.....	.....	.....	8.157	672.3	804.1	724.0	732.2	.....	.....	543.7	839.7	687.0	64.60	.....	.....	.....	.....	.....	.....	NW.	47.069
Means	29.742	29.712	29.731	29.728	30.422	15	29.116	14	.680	56.0	67.0	60.3	61.1	97.0	.....	-2.0	16	40.5	70.0	53.2	.....	.....	.....	.....	.....	.....	.....

*One 11 p. m. observation missed.

†January.

‡April.

§ August.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).	Number of days—						River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.				Northwest.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.							3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	(in which .01 inch or more precipitation fell.)	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Percentages.

March.

February.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.08 a. m., 2.08 p. m., and 10.08 p. m. local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +0.18 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.360; February, 0.350; March, 0.350; April, 0.340; May, 0.330; June, 0.320; July, 0.310; August, 0.300; September, 0.290; October, 0.280; November, 0.270; December, 0.260.

REMARKS.—January 6, lowest temperature on record—20°; January 7, heaviest snow-storm on record, 9.65 inches; January 28, snow disappeared. The floods and Buffalo gnats in spring did great destruction, the former to lives, stock, and property, the latter to stock. Heavy sunsets and long twilights in spring and fall; earthquake shock about 11.15 p. m., November 29; first snow December 17; last snow March 4; first frost (killing) October 24; last frost (light) April 25; last frost (killing) March 10; frost October 24 was very destructive.

D. T. FLANNERY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MILWAUKEE, WIS.

Location of office on December 31, 1884, Mitchell Building, corner East Water and Michigan streets.

[Latitude, 43° 2' N.; longitude, 87° 54' W. Elevation of barometer above sea-level, 697 feet. Elevation of exposed thermometer above ground, 105 feet. Elevation of rain-gauge above ground, 185 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.		Total movement.			
Washington time.			Washington time.			Washington time.			Self-registering thermometers.			Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.							
7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Date.		Amount.	Direction.	Miles.
																						1884.	
29.330	29.329	29.353	29.344	29.374	29.374	29.692	13	1.182	11.2	16.9	12.8	13.645.1	30—24.3	5	69.4	21.2	5.3	1.09	57	1.2	38	W.	10,685
29.291	29.236	29.235	29.244	29.745	29.745	29.694	11	1.059	19.0	24.1	23.3	22.1	19—13.3	29	58.3	29.9	13.5	2.61	43	12.13	40	N.W.	8,536
29.261	29.215	29.241	29.246	29.708	29.708	29.593	11	1.205	25.8	32.7	30.1	22.1	26—8.5	4	66.6	36.3	22.7	2.77	66	7	8	N.E.	9,260
29.213	29.189	29.197	29.200	29.698	29.698	29.448	15	1.250	37.9	43.7	41.2	40.9	37.8	30	47.8	35.4	3.15	105	15	53	N.W.	8,870	
29.178	29.171	29.170	29.174	29.615	29.615	29.761	19	1.484	51.4	57.2	51.9	49.5	20—38.1	16	44.3	62.6	45.1	1.67	53	1	41	N.W.	8,066
29.311	29.290	29.295	29.299	29.574	29.574	29.962	8	1.612	58.2	63.1	59.7	60.3	55.2	23	44.3	74.4	59.5	4.22	103	18	36	S.E.	5,612
29.173	29.158	29.161	29.164	29.477	29.477	29.824	5	1.513	62.4	70.7	64.2	63.8	60.1	22	48.2	74.3	59.5	3.80	144	23	43	N.W.	6,020
29.264	29.263	29.263	29.271	29.639	29.639	29.846	29	1.745	61.4	71.2	64.8	63.8	68.2	10	46.4	72.3	57.6	1.84	50	18	19	S.E.	7,769
29.347	29.314	29.325	29.329	29.709	29.709	29.951	5	1.848	49.6	58.1	52.2	53.3	53.1	3	27.2	53.9	61.5	2.82	139	17	37	S.W.	7,336
29.297	29.290	29.301	29.296	29.649	29.649	29.618	23	1.031	31.3	39.1	34.5	35.0	62.9	9	8.7	42.7	2.18	164	1	22	34	S.W.	8,713
29.304	29.286	29.292	29.294	29.858	29.858	29.622	6	1.386	20.2	23.2	22.6	22.6	31—31.6	31	79.7	29.4	15.0	2.45	72	23	41	N.W.	9,338
Sums	351,244	351,004	351,082	351,111	.....	.....	.....	11,620	498.3	570.9	520.4	526.5	122	34.8	642.1	622.1	1,439.6	630.57	.....	.....	.....	.....	97,142
Means	29.270	29.280	29.287	29.289	29.874	29.448	11.5	.968	40.7	47.6	43.4	43.9	90.1	5	53.5	51.8	36.6	.....	.....	.....	.....	.....	.....

* January.

† April.

‡ July.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Washington time.										Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Mean.				7 a. m.				8 p. m.				11 p. m.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.17 a. m., 2.17 p. m., and 10.17 p. m., local time. Correction for instrumental error of barometer used: From 6.17 a. m., January 1, to 10.17 p. m., December 31, 1884, inclusive, +.010 inch. The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.800; February, 0.800; March, 0.790; April, 0.770; May, 0.740; June, 0.740; July, 0.730; August, 0.730; September, 0.760; October, 0.760; November, 0.790; December, 0.810.

REMARKS.—Last snowfall in spring, April 20; last frost in spring, May 29; first frost in autumn, October 9; first ice in autumn, October 23; first snow in autumn, October 24. The minimum temperature of -21° 6 recorded on December 19 was the lowest December temperature ever recorded at this station. A brilliant meteor was observed at 7.50 p. m., August 19.

SAMUEL W. RHODE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MOBILE, ALA.

Location of office on December 31, 1884, United States Custom-house.

[Latitude, 30° 41' N.; longitude, 88° 2' W. Elevation of barometer above sea-level, 25 feet. Elevation of exposed thermometer above ground, 87 feet. Elevation of rain-gauge above ground, 81 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Washington time.			Monthly mean.			Highest.			Lowest.			Range.			Washington time.			Self-registering ther- mometers.			Mean maximum.			Mean minimum.			Any 3 con- secutive 8 hourly measure- ments.			Maximum hourly velocity during month.			Prevailing direction.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.	3 p. m.	11 p. m.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.		Δ absolute range.	Mean maximum.	Mean minimum.	Total amount.	Last 8 hours.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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1 November.

1 January.

1 June.

Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Washington time.								7 a. m.				8 p. m.				11 p. m.				Mean.				Clear.				Fair.				Cloudy.				On which more precipitation fell.				Minimum below 32°.				Maximum above 80°.				Thunder-storms.				Highest.				Date.				Lowest.				Date.				Range.				Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Number of calm.								7 a. m.				8 p. m.				11 p. m.				Mean.				7 a. m.				8 p. m.				11 p. m.				Mean.				Clear.				Fair.				Cloudy.				On which more precipitation fell.				Minimum below 32°.				Maximum above 80°.				Thunder-storms.				Highest.				Date.				Lowest.				Date.				Range.				Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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* October.

January.

on time, correspond to 6.16 a. m., 2.16 p. m., and 10.16 p. m. local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, $+ .019$ inch.

0.040: May, 0.040; June, 0.010; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

REMARKS.—Office moved from Mauser Building to Custom-house July 1, 1884. The barometers are 6 feet lower than at former office and the thermometers are 51.75 feet higher. Rain-gauge 30.48 feet higher than at former office. No change in correction for elevation. Severe drought during September and October. WES. BLAKE.

WES. BLAKE,
Corporal, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MONTGOMERY, ALA.

Location of office on December 31, 1884, No. 10 Market street

[Latitude, 32° 29' N.; longitude, 86° 18' W. Elevation of barometer above sea-level, 219 feet. Elevation of exposed thermometer above ground, 34 feet. Elevation of rain-gauge above ground, 58 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Mean maximum.	Mean minimum.	Any 3 consecutive hourly measurements.	Maximum hourly velocity during month.	Prevailing direction.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	7 a.m.	3 p.m.	11 p.m.	Date.	Range.	7 a.m.	3 p.m.	11 p.m.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	Date.	Maximum.	Date.	Direction from—	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.

• January.

• November.

• August.

REPORT OF THE CHIEF SIGNAL OFFICER.

3

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time : Number of times observed blowing from—								Dew-point				Relative humidity (per cent.).		Cloudiness (in tenths).			Number of days—													
	Number of calms.								Washington time.				Mean.		7 a. m.		8 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	On white oil inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.
1884.	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On white oil inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.		
Jan.....	12	4	7	10	6	7	4	21	30.8	32.5	34.1	32.5	82.9	61.7	76.3	73.6	6.2	6.2	5.0	4.8	6	12	13	15	1	17	0	0	0		
Feb.....	9	4	9	4	19	14	3	14	43.4	42.4	45.6	43.8	83.1	50.0	78.3	68.8	5.6	4.9	3.8	4.8	9	14	6	12	0	3	0	0	0		
Mar.....	5	9	1	23	11	18	7	19	47.6	46.0	48.9	47.5	82.3	51.1	70.4	67.9	6.1	5.8	3.9	4.9	12	8	11	10	0	0	0	4	0		
Apr.....	7	2	3	9	15	14	17	22	50.0	47.1	50.6	49.2	78.3	45.8	67.1	63.9	5.0	5.5	4.7	6.1	10	9	11	14	0	0	0	4	0		
May.....	6	6	5	12	12	22	7	20	60.8	57.1	61.1	59.7	78.3	42.6	68.0	63.0	5.0	4.6	2.7	4.1	11	16	4	8	0	0	2	4	0		
June.....	1	12	18	24	12	11	6	8	66.5	65.7	67.7	66.6	86.8	58.2	84.3	76.4	6.3	6.5	4.9	5.9	5	14	11	19	0	0	8	12	0		
July.....	12	5	0	8	12	30	12	11	72.3	70.6	72.4	71.8	88.0	57.9	81.7	75.9	3.9	3.9	3.6	3.8	15	12	4	11	0	0	19	4	0		
Aug.....	10	21	4	16	6	6	8	12	68.6	66.4	68.0	68.0	90.8	51.6	77.6	73.3	3.9	4.8	2.0	3.6	14	15	2	11	0	0	11	3	0		
Sept.....	5	23	14	22	11	4	2	5	65.8	62.6	65.7	64.7	84.3	43.8	67.3	65.1	1.9	3.3	2.3	2.5	17	13	0	2	0	0	14	0	0		
Oct.....	8	30	9	16	0	6	1	18	55.5	52.2	57.0	54.9	77.9	39.3	65.6	60.9	2.7	3.5	1.7	2.6	22	4	5	4	0	0	18	0	0		
Nov.....	13	16	7	5	1	6	6	24	41.5	39.0	43.8	41.4	85.4	43.0	74.3	67.6	4.8	4.0	2.7	3.8	15	10	6	8	0	0	8	0	0		
Dec.....	9	13	10	20	6	5	4	19	41.5	43.8	43.7	43.0	84.5	64.4	78.9	75.9	7.8	5.8	5.4	6.3	5	12	14	6	4	0	0	0	0	0	
Sums ..	97	145	87	169	111	143	77	188	644.3	625.4	659.6	643.1	1,003.0	609.4	884.8	832.3	59.2	58.8	42.7	53.6	141	139	86	126	1	24	62	34	0		
Means ..	Percentages.								Percentages.				Percentages.		Percentages.		Percentages.		Percentages.		Percentages.		Percentages.		Percentages.		Percentages.		Percentages.		
	8.9	13.2	7.9	15.4	10.1	13.0	7.0	17.1	53.7	52.1	55.0	53.6	83.6	50.8	73.7	69.4	4.9	4.9	3.6	4.5	38.5	38.0	23.5	34.4	0.3	6.6	16.9	9.3	0.0		

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 6.23 a. m., 2.23 p. m., and 10.23 p. m., local time.

Correction for instrumental error of barometer used : From 0.23 a. m., January 1, to 10.23 p. m., December 31, 1884, inclusive, .000 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.24; February, 0.24; March, 0.24; April, 0.23; May, 0.23; June, 0.23; July, 0.22; August, 0.23; September, 0.23; October, 0.23; November, 0.24; December, 0.24.

REMARKS.—First light frost observed October 17; first killing frost observed November 7.

P. T. JENKINS,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued

MOORHEAD, MINN.

Location of office on December 31, 1884, corner Front and Sixth streets.

[Latitude, 48° 52' N.; longitude, 96° 44' W. Elevation of barometer above sea-level, 923 feet. Elevation of exposed thermometer above ground, 24 feet. Elevation of rain-gauge above ground, 41 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.								Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Washington time.				Monthly mean.						Washington time.				Self-registering thermometers.				Total amount.		Any 3 consecutive 8-hourly measure-ments.		Maximum hourly re- hourly ve-locity during month.		Prevailing direction.		Total movement																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	7 a. m.	3 p. m.	11 p. m.		In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
1884.	In.	In.	In.		In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

* January.

† February.

‡ June.

REPORT OF THE CHIEF SIGNAL OFFICER.

31

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.			Relative humidity (per cent.).					Cloudiness (in tenths).				Number of days—										
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.		
1884.																															
Jan.....	34	2	0	10	16	9	4	10	8-10.9	0	0	0	94.0	86.7	83.6	89.8	4.4	5.3	2.7	4.1	27	81	0	0	0	0	0	0	0	0	0
Feb.....	39	7	1	9	10	3	4	12	2-11.3	0	0	0	85.3	82.6	84.3	87.4	4.1	6.5	5.2	5.3	15	27	0	0	0	0	0	0	0	0	0
Mar.....	20	5	3	15	14	7	12	13	4-11	17.1	7.2	11.0	87.4	81.5	86.1	85.0	4.9	6.5	4.2	5.2	12	20	0	0	0	0	0	0	0	0	0
Apr.....	37	6	4	12	14	4	1	8	4-11	26.0	29.9	28.8	79.2	53.9	73.3	69.8	5.9	6.0	4.8	5.6	15	20	0	0	0	0	0	0	0	0	0
May.....	26	16	2	11	14	11	7	5	1	38.5	38.3	40.1	77.6	43.4	62.6	61.2	5.0	6.2	3.8	5.0	9	12	0	0	0	0	0	0	0	0	0
June.....	8	11	3	14	4	3	2	1	4	56.4	57.7	57.4	82.6	49.2	71.6	67.8	5.3	5.9	3.5	4.9	7	17	0	0	0	0	0	0	0	0	0
July.....	23	7	4	9	20	6	7	15	2	52.5	55.1	55.9	83.0	55.5	70.3	73.2	4.6	7.9	4.0	4.5	0	0	0	0	0	0	0	0	0	0	0
Aug.....	17	6	4	7	30	5	3	13	3	53.1	54.7	52.2	86.1	51.6	61.1	73.9	4.7	4.5	4.2	4.7	0	0	0	0	0	0	0	0	0	0	0
Sept.....	17	5	6	11	18	3	14	11	3	45.3	45.9	47.6	84.6	51.2	73.2	70.3	4.7	7.5	3.7	4.1	0	0	0	0	0	0	0	0	0	0	0
Oct.....	16	3	2	13	25	6	11	15	2	31.6	32.0	33.7	80.0	47.9	69.4	66.8	5.5	6.1	3.8	5.1	2	15	8	9	2	13	0	0	0	0	0
Nov.....	23	6	2	2	25	9	4	17	1	16.6	22.2	18.5	83.6	68.0	81.1	78.2	4.7	6.2	4.6	5.2	9	12	9	12	9	13	27	0	0	0	0
Dec.....	27	2	1	2	23	7	11	18	2	1.0	6.3	1.2	85.0	83.1	84.7	84.9	5.7	6.8	6.2	6.2	12	24	30	0	0	0	0	0	0	0	0
Sums ..	287	76	33	115	239	75	80	133	40	304.3	355.8	338.5	383.0	1025.4	759.6	937.2	907.3	59.2	77.3	50.2	62.2	85	179	92	105	111	180	2	30	10	10
Means ..	24.1	6.9	3.0	10.5	23.6	6.8	7.3	12.1	3.6	25.4	29.6	28.2	27.7	85.4	63.3	78.1	75.6	4.9	6.4	4.2	5.2	26.0	48.9	25.1	28.7	30.3	49.2	0.8	2.2	7	7
	Percentages.																														

Percentages.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.41 a. m., 1.41 p. m., and 9.41 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 3 p. m., August 6, inclusive, +.004 inch; from 7 p. m., August 6, to 11 p. m., December 31, 1884, inclusive, —.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.11; February, 1.10; March, 1.08; April, 1.08; May, 0.96; June, 0.97; July, 0.96; August, 0.97; September, 0.99; October, 1.02; November, 1.06; December, 1.11.

REMARKS.—Extra barometer substituted for station barometer August 6; hence change in "instrumental error."

L. M. DEY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

MOUNT WASHINGTON, N. H.

Location of office on December 31, 1884, Signal office, summit.

[Latitude, 44° 10' N.; longitude, 71° 19' W. Elevation of barometer above sea-level, 6,279 feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometer.					Any 3 consecutive 8-hourly measurements.		Total amount.	Maximum hourly velocity during month.				Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Washington time.			Monthly mean.	Range.	Date.	Lowest.	Date.	Highest.	Date.	Lowest.	Date.	Highest.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Largest amount.	Date.	Miles.	Direction from—	Date.	Miles.	Direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.	3 p. m.	11 p. m.																							7 a. m.		3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
1884.	In.	n.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°

* Insufficient, owing to frost-work, &c.

† June.

‡ February.

§ December.

Meteorological summary for the year ending December 31, 1884—Continued.

MYER, FORT, VA.

[Latitude, 38° 58' N.; longitude 77° W. Elevation of barometer above sea-level, 267 feet. Elevation of exposed thermometer above ground, 43.67 feet. Elevation of rain-gauge above ground, 1.17 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	Washington time.					Monthly mean.	Washington time.					Self-registering thermometers.					Mean maximum.	Mean minimum.	Any 3 consecutive 8-hourly measurements.		Total amount.	Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.		Date.	Minimum.	Absolute range.		Date.	Maximum.	Date.	In.	Th.	Direction			Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
									Lowest.	Highest.										Date.		Range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
1884.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th.	In.	Th

July.

April.

January.

For 20 days.

For 90 days.

For 25 days.

For 37 days.

MYER, FORT, V A.—Continued.

Month.	Winds at 7 a. m. 3 and 11 p. m. Washington time: Number of times observed blowing from—						Dew-point.			Relative humidity (per cent.).					Cloudiness (in tenths).			Number of days—									
	Number of calms.																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Auroras.		
1894.																											
Jan.....	7	12	3	2	4	19	8	26	10	20.5	22.8	23.2	22.5	87.1	74.2	82.3	81.2	6.1	4	16	11	13	7	27	0	0	
Feb.....	6	12	9	10	7	9	4	19	11	33.2	32.7	32.5	32.8	88.2	60.6	80.7	78.5	5.8	4	15	10	16	1	15	0	0	
Mar.....	1	5	11	14	7	7	37	9	31.6	33.5	32.4	32.5	84.3	64.6	80.7	75.3	6.1	6	9	16	19	3	12	0	1	1	
Apr.....	4	9	4	7	6	8	38	10	34.8	34.6	36.9	35.4	71.8	49.6	67.1	62.8	5.1	6	11	10	7	0	0	0	0	0	
May.....	5	5	9	12	10	24	8	24	11	49.6	50.0	51.0	50.2	77.2	52.4	74.3	68.0	4.1	6	14	8	14	0	0	0	3	
June.....	1	12	16	16	11	7	4	12	11	60.2	61.5	63.1	61.8	85.0	59.7	81.1	75.1	4.8	10	13	7	8	0	0	0	0	
July.....	5	2	8	3	10	18	10	30	7	61.9	63.8	62.6	62.5	84.0	61.3	80.1	75.1	4.9	6	21	4	12	0	0	2	6	
Aug.....	7	2	6	6	10	8	8	22	24	64.1	63.8	64.2	64.2	88.5	60.4	80.4	77.8	4.6	9	18	4	7	0	0	3	0	
Sept.....	7	6	3	6	19	27	0	11	11	57.8	57.8	58.8	58.1	85.0	49.0	74.9	68.6	2.5	17	10	3	2	0	1	0	0	
Oct.....	14	6	5	0	16	14	7	22	9	46.7	46.9	47.2	46.9	81.7	51.6	73.9	69.0	2.4	16	10	5	7	0	2	1	0	
Nov.....	12	5	4	3	12	14	3	22	11	32.1	32.5	33.1	32.7	80.5	53.2	71.6	68.4	3.0	15	8	7	6	0	13	0	0	
Dec.....	15	5	4	0	11	9	8	29	11	24.2	28.8	28.1	27.7	85.5	69.5	79.1	78.0	5.7	7	11	18	9	20	0	0	0	
Sums..	84	81	82	83	125	145	75	298	123	513.7	523.2	532.7	523.8	906.8	712.1	923.0	878.9	59.2	112	156	98	122	18	91	14	17	1
	Percentages.												Percentages.														
Means.	7.7	7.4	7.5	7.6	11.3	12.2	43.2	44.1	44.4	43.9	83.2	59.2	77.2	73.2	4.9	5.4	4.4	4.9	30.6	43.6	33.8	4.9	24.9	2.8	4.6	0.3	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7 a. m., 3 p. m., and 11 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884 inclusive, $+ .002$ inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.300; February, 0.300; March, 0.300; April, 0.290; May, 0.280; June, 0.280; July, 0.280; August, 0.280; September, 0.280; October, 0.290; November, 0.300; December, 0.300.

GEO. HEATHCOTE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

NASHVILLE, TENN.

Location of office on December 31, 1884, Barnes' Block, Public Square and North Market street.

[Latitude, 36° 30' N.; longitude, 86° 47' W. Elevation of barometer above sea-level, 549 feet. Elevation of exposed thermometer above ground, 61 feet. Elevation of rain-gauge above ground, 79 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.							
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	In.	Washington time.			Self-registering thermometers.				Total amount.	Largest amount.	Date.	Miles.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.					
	7 a. m.	8 p. m.	11 p. m.								Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.													
																						7 a. m.	8 p. m.			11 p. m.				
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Miles.	Direction.	Total movement.	
Jan.	28.680	28.611	28.657	28.643	30.074	28	23.136	31	1.938	24	0	35.4	29.3	30.163	0	30	-10.2	9	75.6	39.4	21.5	7.20	1.16	7.8	86	NW.	31	NW.	5,820	
Feb.	28.504	28.442	28.490	28.479	28.909	16	23.856	19	1.353	42	51.4	44.5	44.5	46.071	9	12	9.8	29	62.1	54.9	38.0	8.18	2.32	6.7	49	W.	19	E. S.	5,185	
Mar.	28.462	28.419	28.438	28.439	29.828	9	23.955	1	1.878	43	54.3	48.2	49.2	49.176	2	23	19.4	14	56.8	57.4	42.1	8.89	2.33	25	31	W.	1	E.	5,465	
Apr.	28.377	28.345	28.359	28.360	29.599	11	23.897	14	1.742	50	62.5	55.7	55.7	56.381	5	29	34.1	9	47.4	65.5	48.3	3.51	1.07	14	46	NW.	2	W.	5,427	
May	28.422	28.377	28.401	28.400	29.614	30	29.169	18	1.445	63	75.4	67.2	67.2	68.387	8	22	48.4	80	38.4	77.7	59.9	3.58	1.26	18	14	SW.	4	W.	5,028	
June	28.442	28.400	28.418	28.420	29.600	16	29.096	9	1.561	68	78.9	71.8	71.8	73.192	2	23	58.3	1	33.9	81.5	66.0	6.53	1.59	6	36	NW.	5	E.	3,524	
July	28.393	28.357	28.373	28.374	29.568	21	29.189	9	1.879	72	86.2	76.6	76.6	78.193	6	63	8	29	88.7	70.2	3.18	1.70	9	47	NW.	5	W.	3,294		
Aug.	28.506	28.453	28.480	28.480	29.609	9	29.189	29	1.450	68	84.0	73.7	73.7	75.494	3	29	58.5	6	37.8	85.8	66.8	2.81	1.44	3	88	NW.	29	NW.	3,100	
Sept.	28.529	28.468	28.501	28.499	29.723	15	29.202	23	1.431	67	82.5	73.2	73.2	74.391	2	3	51.5	19	38.7	84.8	66.1	2.36	.59	27	27	S.	23	E.	3,183	
Oct.	28.505	28.542	28.506	28.509	29.859	24	29.328	8	1.531	58	73.6	63.8	63.8	65.391	1	1	80.3	24	61.7	76.0	55.9	2.43	1.43	29	31	SE.	26	NW.	3,969	
Nov.	29.565	29.526	29.550	29.547	29.940	6	29.067	28	1.853	41	54.4	46.9	46.9	48.173	1	8	37.3	24	45.8	56.6	37.5	1.57	.65	23	40	SE.	23	W.	3,547	
Dec.	28.597	28.515	28.551	28.541	29.969	19	29.017	6	1.062	36	9	44.6	39.7	40.497	0	30	0.9	19	66.1	40.6	31.2	3.78	1.13	14	30	W.	14	SE.	5,810	
Sums	354,012	353,455	353,785	353,761	380,074	26	28,868	119	8,311	637.4	784.2	691.6	704.4	594.1	312.3	902.0	54.02	NW.	53,788
Means	28.501	28.465	28.482	28.479	29.479	65.4	57.6	57.6	58.794	58	-10.2	49.7	63.8	50.2

* January.

† February.

‡ July.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—					Dew-point.	Relative humidity (per cent.).					Cloudiness (in tenths).	Number of days—					River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.		Southwest.	West.	Northwest.	Washington time.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
										7 a. m.	3 p. m.		11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.		Mean.	Clear.	Fair.	Cloudy.	On which more precipitation fell.	Minimum below 32°.	Maximum below 32°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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* See L. R. . † March.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.21 a. m., 2.21 p. m., and 10.21 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884 inclusive, + .007 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.610; February, 0.610; March, 0.600; April, 0.580; May, 0.570; June, 0.560; July, 0.560; August, 0.560; September, 0.570; October, 0.580; November, 0.600; December, 0.610.

[illegible]

L. N. JESUNOFSKY, Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

NEW HAVEN, CONN.

Location of office on December 31, 1884, Insurance Building, No. 370 Chapel street.

[Latitude, 41° 18' N.; longitude, 73° 56' E. Elevation of barometer above sea-level, 107 feet. Elevation of exposed thermometer above ground, 112 feet. Elevation of rain-gauge above ground, 109 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Washington time.					Monthly mean.	Self-registering thermometers.					Mean maximum.		Total amount.	Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	7 p. m.	3 p. m.	11 p. m.	Date.	In.		Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.		Minimum.	Date.	Absolute range.	Mean minimum.		Date.	Direction from—	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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January.

February.

June.

December.

REPORT OF THE CHIEF SIGNAL OFFICER.

397

Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from —										Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days —																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.16 a. m., 3.16 p. m., and 11.16 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1894, inclusive, + .007 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.120 February, 0.120; March, 0.120; April, 0.120; May, 0.120; June, 0.110; July, 0.110; August, 0.110; September, 0.110; October, 0.120; November, 0.120; December, 0.120.

J. H. SHEPHERD,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

NEW LONDON, CONN.

Location of office on December 31, 1884, United States custom-house.

[Latitude 41° 21' N., longitude, 72° 8' W. Elevation of barometer above sea-level, 47 feet. Elevation of exposed thermometer above ground, 29 feet. Elevation of rain-gauge above ground, 53 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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	7 p. m.		11 p. m.		Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.		11 p. m.		Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Total amount.		Date.			Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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January.

February.

September.

§ December.

REPORT OF THE CHIEF SIGNAL OFFICER.

399

Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—										Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Month.										Washington time.										Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
										North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.										8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.20 a. m., 3.20 p. m., and 11.20 p. m., local time.

Correction for instrumental error of barometer used: From 7.20 a. m., January 1, to 11.20 p. m., December 31, 1884, inclusive, +.005 inch.

The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

REMARKS.—January, the most destructive gale for years occurred on the 29th; February, severe storms on the 1st, 20th, 23d, and 29th; March, gales on the 19th, 26th, and 30th; April, very mild weather after first week; May, unusual displays of sheet-lightning on the 23d, 23d, and 24th; June, last frost of the season on the 15th, mirage 23d, very heavy rain 25th and 26th; July, remarkably low barometer and very small range; August, earthquake on the 10th, at 2.12 p. m.; September, highest temperature of the year on the 10th, very dry month; October, first light frost on the 10th, first killing frost 16th, mirage 15th; November, first snow 19th, remarkable meteor 5th, very severe gale 23d and 24th; December, extremes of temperature, lowest of the year on the 20th, dangerous gales, large rainfall.

JNO. G. LYNCH.

Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

NEW ORLEANS, LA.

Location of office on December 31, 1884, United States custom-house.

[Latitude, 29° 29' N.; longitude, 90° 4' W. Elevation of barometer above sea-level, 52 feet. Elevation of exposed thermometer above ground, 45 feet. Elevation of rain gauge above ground, 84 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.							Precipitation.			Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Washington time.					Monthly mean.					Washington time.					Self-registering ther- mometers.					Any 3 con- secutive 8-hourly measure- ments.			Maximum hourly velocity during month.			Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	7 a. m.	3 p. m.	11 p. m.	Range.	Date.	Lowest.	Date.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.			In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.

July.

April.

January.

March.

1 December.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.08 a. m., 2.08 p. m., and 10.08 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, $-.004$ inch.

1950 Jan. 0.050 : June. 0.050 : July. 0.050 : August. 0.050 : September. 0.050 : October. 0.050 : November. 0.000 : December. 0.000 :
 The barometric observations may be rounded to sea-level by adding the following constants for the various months : January, 0.000 ; February, 0.000 ; March, 0.000 ; April, 0.000 ;
 May, 0.000 ; June, 0.000 ; July, 0.000 ; August, 0.000 ; September, 0.000 ; October, 0.000 ; November, 0.000 ; December, 0.000.

REMARKS.—Destructive floods in the Mississippi and Red River Valleys from February to June, inclusive.

M. HERMAN,
President, National Education Association

Meteorological summary for the year ending December 31, 1884—Continued.

NEW YORK CITY.

Location of office on December 31, 1884, Equitable building.

[Latitude, 40° 49' N.; longitude, 74° 0' W. Elevation of barometer above sea-level, 164 feet. Elevation of exposed thermometer above ground, 148 feet. Elevation of rain-gauge above ground, 145 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.				Wind.								
	Washington time.					Monthly mean.					Self-registering thermometers.					Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		Total movement.						
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Range.	Highest.	Lowest.	Date.	In.	Th.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Amount.	Date.	Miles.	Direction.	Date.	Miles.	Direction.					
1884.																												
Jan.....	28.982	28.925	28.955	28.954	30.681	27.28.941	27.28.941	9	1.720	28.5	28.4	25.7	26.247.0	0	0	0	0	7.8	7	32.2	32.9	19.7	8.9	23	E.	9	SW.	6.203
Feb.....	28.905	28.885	28.942	28.911	30.561	28.90.229	28.90.229	28	1.538	33.9	33.0	33.3	35.161.0	0	0	0	0	2.0	29	58.0	42.2	27.8	17.8	40	W.	20	N.E.	6.610
Mar.....	28.873	28.808	28.850	28.846	30.277	28.90.337	28.90.337	26	1.640	32.6	42.1	34.8	37.561.0	0	0	0	0	5.0	1	65.0	44.1	31.8	19.0	26	W.	30	W.	6.805
Apr.....	28.698	28.683	28.685	28.676	30.015	28.98.666	28.98.666	2	1.059	44.2	53.8	45.4	47.673.5	30	32.1	0	0	4.1	4	54.6	40.6	2.68	7.8	2	N.W.	4	N.W.	6.910
May.....	28.768	28.748	28.798	28.781	30.145	28.99.416	28.99.416	11	1.299	55.0	64.9	54.5	58.847.7	24	42.1	0	0	15.9	15	42.9	68.0	51.8	6.7	31	N.E.	7	W.	6.164
June.....	28.940	28.922	28.921	28.921	30.378	28.98.572	28.98.572	15	1.008	64.8	75.6	65.8	68.792.0	21	49.1	0	0	8.7	4	79.3	63.1	4.16	12.3	30	N.E.	26	S.	6.113
July.....	28.720	28.664	28.701	28.664	29.847	28.90.407	28.90.407	18	1.440	66.8	75.6	67.9	70.390.5	8	57.4	0	0	20	23	35.7	78.3	63.1	12.3	30	W.	23	W.	7.131
Aug.....	28.967	28.873	28.947	28.892	30.176	28.95.578	28.95.578	14	1.007	68.5	76.7	68.3	71.592.0	10	60.9	0	0	10	50	34.1	79.3	61.9	15	27	S.	30	S.E.	6.852
Sept.....	28.906	28.870	28.947	28.941	30.815	28.97.8	28.97.8	17	1.737	64.6	76.7	67.6	69.982.0	10	60.9	0	0	10	50	34.1	79.3	61.9	15	27	S.	30	S.E.	6.852
Oct.....	28.906	28.873	28.947	28.941	30.815	28.97.8	28.97.8	17	1.737	64.6	76.7	67.6	69.982.0	10	60.9	0	0	10	50	34.1	79.3	61.9	15	27	S.	30	S.E.	6.852
Nov.....	28.914	28.878	28.959	28.934	30.292	28.98.26	28.98.26	22	1.123	58.6	67.6	42.2	43.382.6	15	20.8	0	0	15	20.8	41.8	51.6	33.8	2.44	140	W.	18	W.	8.644
Dec.....	28.608	28.657	28.974	28.930	30.512	28.93.24	28.93.24	7	1.178	31.7	37.6	34.5	34.680.0	81	1.2	0	0	1.2	20	58.8	41.7	28.5	6.66	210	N.W.	9	N.W.	8.419
Sums ..	368.709	366.118	368.546	368.400	.....	.....	.....	.....	11.731	678.1	670.6	599.8	619.0	.....	545.719	268.4	365.84	.....	.....	.....	.....	.....	.....	70.275	.....	.....	.....	.....
Means ..	28.892	28.843	28.879	28.871	30.681	27.28.956	27.28.956	28	.978	48.2	56.6	49.9	51.692.0	.....	1.290	45.4	59.9	44.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

1 January.

2 April.

3 June.

4 August.

5 September.

6 December.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.			Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.				
1884.																														
Jan.....	8	17	1	2	4	21	20	13	7	18.2	22.6	20.1	27.0	29.3	30.3	85.6	74.2	74.9	79.3	78.4	7.3	5.8	4.6	7.7	0	0	0			
Feb.....	3	24	2	7	5	9	18	6	10	29.0	30.1	29.0	30.1	29.3	29.3	78.7	67.1	67.1	75.1	73.6	6.8	6.8	5.7	0	0	0				
Mar.....	6	18	2	7	6	8	21	14	11	27.6	31.1	29.6	30.6	29.3	29.3	78.7	67.1	67.1	75.1	73.6	7.0	7.4	5.1	0	0	0				
Apr.....	15	6	0	5	7	6	5	26	8	35.3	38.9	36.6	36.6	36.6	36.6	71.9	58.3	58.3	72.2	68.6	6.5	6.1	4.6	0	0	0				
May.....	6	5	5	12	14	13	21	11	6	47.4	47.1	47.4	47.8	47.8	47.8	76.6	55.8	55.8	73.2	68.6	5.5	5.9	4.9	0	0	0				
June.....	7	13	14	13	18	16	6	3	0	56.7	57.7	58.2	58.2	57.5	57.5	78.5	58.7	58.7	77.7	70.3	3.0	4.0	3.1	0	0	0				
July.....	9	6	6	13	13	20	18	1	1	60.1	60.1	61.2	60.5	60.5	60.5	79.8	63.0	63.0	80.4	74.1	5.5	5.0	3.7	0	0	0				
Aug.....	4	10	4	22	20	6	9	11	1	62.9	62.8	63.7	63.1	63.1	63.1	84.2	64.2	64.2	83.0	76.8	4.9	6.4	4.1	0	0	0				
Sept.....	7	4	7	6	24	16	18	8	0	58.0	58.2	59.0	58.3	58.3	58.3	81.3	64.3	64.3	74.8	70.3	2.5	3.7	2.1	0	0	0				
Oct.....	6	8	6	5	12	14	29	13	0	45.0	45.4	45.6	45.2	45.2	45.2	78.3	57.5	57.5	78.5	68.5	4.1	5.0	4.2	0	0	0				
Nov.....	9	8	5	3	6	17	28	12	2	32.8	34.0	33.1	34.0	34.0	34.0	76.9	60.0	60.0	76.7	71.4	4.5	4.8	4.0	0	0	0				
Dec.....	13	13	3	3	3	15	17	21	5	27.0	28.8	28.4	28.4	28.4	28.4	84.9	74.9	74.9	78.8	79.5	6.4	6.6	3.9	0	0	0				
Sums ..	93	137	68	94	131	153	215	166	51	502.1	515.1	512.4	509.9	504.5	504.5	788.5	703.5	703.5	828.8	879.7	64.0	68.5	51.2	60.4	0	0	0			
	Percentages.																													
Means .	8.5	12.5	6.2	8.0	11.9	13.9	19.0	14.2	4.6	41.8	42.9	42.7	42.5	79.5	63.2	77.2	73.8	5.8	5.5	4.3	5.0	31.4	42.6	38.0	98.9	6.6	22.4	1.94	1	0

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7 12 a. m., 3 12 p. m., and 11 12 p. m., local time.
 Correction for instrumental error of barometer used: From 7 12 a. m., January 1, to 11 12 p. m., December 31, 1884, inclusive, +.009 inch.
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.190; February, 0.190; March, 0.180;
 April, 0.180; May, 0.180; June, 0.170; July, 0.170; August, 0.170; September, 0.170; October, 0.180; November, 0.180; December, 0.180.
 W. W. EICHELBARGER,
 Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

NORFOLK, VA.

Location of office on December 31, 1884, Dalton building, corner Main street, Roanoke avenue.

[Latitude, 36° 51' N.; longitude, 76° 17' W. Elevation of barometer above sea-level, 30 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 53 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Washington time.					Washington time.					Self-registering thermometers.					Any 8-consecutive 8-hourly measurements.	Total amount.	Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	7 P. M.		11 P. M.		Monthly mean.	7 P. M.		11 P. M.		Monthly mean.	Maximum.		Minimum.	Date.	Absolute range.			Mean maximum.	Mean minimum.	Largest amount.		Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	<i>T_m</i>	<i>T_a</i>	<i>T_w</i>	<i>T_p</i>		<i>T_n</i>	<i>T_m</i>	<i>T_a</i>	<i>T_w</i>		<i>T_p</i>	<i>T_n</i>				<i>T_m</i>	<i>T_a</i>				<i>T_w</i>						<i>T_p</i>	<i>T_n</i>	<i>T_m</i>	<i>T_a</i>	<i>T_w</i>	<i>T_p</i>	<i>T_n</i>	<i>T_m</i>	<i>T_a</i>	<i>T_w</i>	<i>T_p</i>	<i>T_n</i>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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• January.

• April.

• July.

NORFOLK, VA.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—							River.																										
	Number of calms.								7 a. m.		8 p. m.		11 p. m.		Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.	Lowest.	Date.	Range.	Mean.																				
North.	Northeast.	Southeast.	South.	Southeast.	West.	Northwest.	Number of calms.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Pt. In.	Pt. In.	Date.	Lowest.	Range.	Mean.																			
1884.																																																
Jan....	31	12	2	3	6	23	11	2	8	28.9	23.7	30.1	29.6	73.3	63.4	72.8	71.8	6.7	6.0	5.4	6.0	8	10	13	15	3	20	0	0	17	6	11	3	0	16	3												
Feb....	14	10	9	1	15	17	4	9	11	42.9	43.2	41.4	42.5	85.5	67.0	76.6	76.4	6.1	6.1	5.3	5.8	6	12	11	15	1	5	0	1	18	6	18	15	0	9	10	3	6	16	9								
Mar....	14	8	6	10	11	7	8	17	11	40.1	42.3	41.9	41.4	79.4	65.3	77.1	73.9	4.8	6.3	4.0	5.0	8	15	8	17	0	4	0	2	18	0	30	31	15	0	10	11	12	3	0	16	7						
Apr....	9	21	7	11	3	5	7	18	9	42.8	41.4	42.8	42.3	73.4	53.4	71.6	66.2	5.7	5.9	3.6	5.1	10	11	9	8	0	0	2	19	0	80	81	15	6	17	1	4	6	16	11								
May....	8	16	7	10	17	12	7	8	13	54.2	54.0	56.1	55.4	73.5	50.9	74.9	67.1	4.8	6.0	3.6	4.4	11	14	6	7	0	0	1	19	0	29	30	15	6	11	4	6	16	11									
June....	6	20	7	12	16	20	4	8	2	63.4	63.4	63.9	63.9	80.6	63.1	80.5	74.7	4.9	6.0	4.8	5.1	10	10	10	10	0	0	3	1	19	0	1, 2, 28	15	6, 8, 15, 22	4	0	16	10	5	16	10							
July....	10	9	8	5	16	31	6	8	2	67.7	68.5	68.8	68.2	82.6	62.5	82.6	75.2	6.1	4.4	3.1	4.5	10	13	8	13	0	0	3	1	18	0	27, 28	14	6	21	4	0	16	5	16	7							
Aug....	9	29	15	2	14	17	2	2	8	68.7	68.2	68.5	68.5	85.0	64.1	80.1	73.7	2.7	3.1	1.2	2.3	20	8	2	2	0	0	3	0	18	0	13	14	6	21	4	0	16	7	16	7							
Sept....	6	17	7	9	19	22	0	6	8	64.2	62.8	64.2	63.7	84.0	54.1	80.1	72.7	3.1	3.9	2.3	3.1	17	13	1	4	0	0	0	0	18	3	12, 26	14	8	17	4	0	16	5	16	6							
Oct....	16	19	11	8	11	17	8	6	2	53.6	55.2	55.3	54.7	81.0	57.7	73.5	72.9	3.1	3.9	2.3	3.1	17	13	1	4	0	0	0	0	19	0	9	15	0	16	31	4	0	16	6	16	6						
Nov....	18	20	8	3	6	8	10	15	2	41.9	43.0	44.2	43.0	81.7	59.1	75.3	72.9	3.8	4.1	4.8	4.1	15	7	8	7	0	0	0	0	19	0	24	14	9	2	4	3	17	0	16	6							
Dec....	29	15	8	3	12	17	6	8	6	63.9	59.0	58.5	57.8	81.4	69.8	79.2	76.8	5.7	7.2	5.4	6.1	4	15	12	16	2	7	0	0	19	0	25	14	3	29	4	9	10	6	16	6							
Sums	170	196	82	77	146	194	66	93	72	607.2	610.7	615.2	611.0	968.5	873.2	933.5	878.1	169.4	163.4	146.4	153.7	129	139	98	125	6	36	10	8	47	3	199	9				
Means	15.5	17.9	7.5	7.0	13.1	17.9	6.0	8.5	6.6	50.6	50.9	51.3	50.9	80.6	61.1	77.9	73.2	5.9	5.3	3.9	4.7	35.2	38.0	26.8	34.2	1.0	9.2	7.2	2	19	6	*29	14	3	117	192	3	11.2	16	7	8

† December.

† September.

* May.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 7.08 a. m., 8.03 p. m., and 11.08 p. m., local time.

Correction for instrumental error of barometer used: From 7.08 a. m., January 1, to 11.03 p. m., December 31, 1884, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030; April, 0.030; May, 0.039; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

JAMES P. SHERRY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

NORTH PLATTE, NEBR.

Location of office on December 31, 1884, southwest corner Fifth and Spruce streets.

[Latitude, 41° 8' N.; longitude, 100° 45' W. Elevation of barometer above sea-level, 2,841 feet. Elevation of exposed thermometer above ground, 21 feet. Elevation of rain-gauge above ground, 34 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Any 3 consecutive hourly measurements.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	7 a. m.		9 p. m.		11 p. m.		Range.		Date.		Lowest.		Highest.		Date.		Range.		7 p. m.		9 p. m.		11 p. m.		Monthly mean.		Maximum.		Date.		Minimum.		Absolute range.		Mean maximum.		Mean minimum.		Total amount.		Large amount.		Date.		Miles.		Direction.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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* One 7 a. m. observation taken late.

January.

March.

July.

February.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.25 a. m., 1.25 p. m., and 9.25 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1894, inclusive, $-.010$ inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.120; February, 3.100; March, 3.000; April, 2.960; May, 2.870; June, 2.800; July, 2.800; August, 2.800; September, 2.880; October, 2.960; November, 3.080; December, 3.160.

REMARKS.—January, February, March, April, temperature lower than usual; deficiency in rainfall. May unusually cold; season backward one month. June, marked deficiency in rainfall. July, August, September, October, November, December, the coldest for several years. A very marked deficiency in precipitation throughout year.

E. F. BRADY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

OLYMPIA, WASH.

Location of office, Fourth street.

[Latitude, 47° 3' N.; longitude, 123° 53' W. Elevation of barometer above sea-level, 36 feet. Elevation of exposed thermometer above ground, 22 feet. Elevation of rain-gauge above ground, 38 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.								Precipitation.				Wind.							
	Washington time.					Monthly mean.					Washington time.		Self-registering thermometers.						Any 3 consecutive 8-hourly measurements.				Maximum hourly velocity during month.		Prevailing direction.	Total movement.				
	7 a. m.		3 p. m.		11 p. m.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.		3 p. m.		11 p. m.	Monthly mean.	Maximum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.			Miles.	Direction from—		
	In.	W.	In.	W.	In.						In.	W.	In.	W.	In.														W.	
1884.																														
Jan.	30.060	30.101	30.074	30.085	30.518	22	30.410	26	1.108	87.8	40.6	39.0	39.1	54.0	4	23.0	30	24.0	44.1	35.2	5.47	177	8.4	22	SW.	9	1.320			
Feb.	30.015	30.020	30.090	30.012	30.544	26	30.378	17	1.296	80.2	33.5	33.2	34.0	59.1	29	2.0	11	57.1	42.5	4.17	1.12	23	24	19	N.	10	1.265			
Mar.	30.001	30.007	30.079	30.006	30.520	26	30.520	9	.981	82.6	45.5	45.0	42.4	64.0	31	23.0	7	39.0	52.5	4.57	.86	22	18	W.	10	1.559				
Apr.	30.005	30.005	30.084	30.008	30.517	8	30.465	10	.762	41.0	52.0	53.0	51.0	78.0	31	33.0	27	41.0	61.7	6.00	.86	11	18	W.	11	1.574				
May	30.007	30.003	30.088	30.009	30.500	29	30.707	19	.553	43.8	61.9	60.5	58.1	87.0	31	30.0	28	51.0	70.1	43.9	1.40	4.9	19	SW.	5	1.933				
June	30.025	30.025	30.089	30.016	30.109	17	30.611	21	.408	50.0	63.4	62.2	61.2	87.0	1	40.0	14	47.0	71.5	48.9	1.20	1.43	26	42	SW.	24	1.900			
July	30.006	30.018	30.079	30.001	30.185	8	30.698	13	.457	52.4	66.2	65.0	64.0	84.0	13	43.0	4	41.0	73.0	50.5	.60	.23	18	16	SW.	5	1.898			
Aug.	29.966	29.968	29.927	29.954	30.200	28	29.761	26	.439	57.2	69.8	70.0	65.7	92.0	3	47.0	16	45.0	77.8	54.4	.96	.87	26	27	10	SW.	14	1.225		
Sept.	29.997	29.971	29.954	29.964	30.266	26	29.644	7	.622	50.6	57.9	56.2	54.9	70.0	1	41.0	26	29.0	62.9	48.6	3.06	.63	10	17	SW.	1	1.641			
Oct.	30.004	30.017	30.003	30.008	30.410	26	30.426	12	.864	46.7	53.8	49.8	50.1	68.5	17	34.5	3	32.0	58.8	43.7	4.20	.98	7	8	S.	8	1.723			
Nov.	30.056	30.066	30.051	30.058	30.363	26	30.797	6	.566	43.6	49.1	46.4	47.0	63.0	7	33.0	80	32.0	58.0	43.3	1.37	.55	24	14	S.	24	1.569			
Dec.	29.925	29.932	29.925	29.927	30.446	6	29.167	19	1.279	30.1	35.1	32.9	32.7	54.0	8	8.0	29	46.0	39.5	28.0	6.93	.32	18	19	N.E.	16	1.470			
Sums	350.757	364.833	364.538	359.708					9.525	537.0	635.8	615.3	592.7						492.1	707.6	500.0	85.58					17,890			
Means	29.860	30.066	29.961	29.976	30.564	26	29.167	19	.794	43.9	53.0	51.3	49.4	62.0	12	2.0	11	40.2	59.0	41.7						S.				

† December.

‡ August.

• February.

• February.

† December.

‡ August.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.	Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 30°.	Thunder storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.57 a. m., 11.57 a. m., and 7.57 p. m., local time.

Correction for instrumental error of barometer used: From 3.57 a. m., January 1, to 7.57 p. m., December 31, 1894, inclusive, +0.20 inch

The barometric observations may be reduced to sea level by adding the following constants for the various months: January 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

REMARKS.—Last frost, May 28; first ice, December 6; first snow, December 13.

JNO. DASCOMB,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

OMAHA, NEBR.

Location of office on December 31, 1884, United States custom-house, corner of Fifteenth and Dodge streets.

[Latitude, 41° 10' N.; longitude, 95° 56' W. Elevation of barometer above sea-level, 1,113 feet. Elevation of exposed thermometer above ground, 50 feet. Elevation of rain-gauge above ground, 71 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Washington time.					Monthly mean.					Highest.					Lowest.					Range.					Washington time.					Self-registering thermometers.					Mean maximum.		Mean minimum.		Total amount.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	7 p. m.	3 p. m.	11 p. m.	In.	Th.	Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.		Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.	Th.	Lowest.

• January.

† March.

‡ July.

Month.	Wind at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—								River.							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Clear.	Rain.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.	Highest.	Date.		Lowest.	Fr. In.	Fr. In. Ft. In.	Range.	Mean.			
									7 a. m.	3 p. m.	11 p. m.	Mean.																				
1884.																																
Jan ..	28	3	1	6	21	13	6	13	2	9	11.1	11.5	9.5	73.3	65.4	70.0	69.6	13	13	5	6	14	30	0	0	0	0	0	0	0	0	0
Feb ..	33	4	2	5	14	2	8	14	5	7.7	13.7	13.2	11.5	73.1	64.8	70.3	72.1	6	14	9	12	16	27	0	0	0	0	0	0	0	0	0
Mar ..	25	9	6	16	10	7	6	10	4	24.3	28.9	28.2	27.1	79.9	65.0	75.0	73.3	5	17	9	12	5	15	0	0	0	0	0	0	0	0	0
Apr ..	24	8	2	22	6	7	2	13	6	37.0	38.6	39.1	38.2	83.4	59.8	73.9	72.0	7	14	17	0	4	0	3	0	0	0	0	0	0	0	0
May ..	19	3	7	16	18	4	7	13	6	49.0	51.3	51.4	50.6	81.8	54.2	72.0	69.3	8	15	8	12	0	0	0	0	0	0	0	0	0	0	0
June ..	11	6	3	28	28	5	2	3	4	62.4	63.4	64.2	63.3	86.8	59.7	79.6	75.4	7	19	4	8	0	0	0	0	0	0	0	0	0	0	0
July ..	22	11	5	23	15	7	1	6	3	63.7	65.7	66.4	65.8	85.6	59.6	79.7	75.0	6	17	0	0	0	0	0	0	0	0	0	0	0	0	0
Aug ..	13	3	2	23	24	13	2	12	1	60.0	61.2	62.5	61.2	86.5	60.2	73.2	75.0	15	12	4	9	0	0	0	0	0	0	0	0	0	0	0
Sept ..	11	3	2	20	36	3	2	12	1	57.1	60.6	60.9	59.5	84.4	60.4	79.6	74.8	13	11	6	9	0	0	0	0	0	0	0	0	0	0	0
Oct ..	18	0	2	11	38	7	3	13	1	44.5	48.0	47.1	46.5	78.4	57.3	72.3	69.3	15	10	6	9	0	0	0	0	0	0	0	0	0	0	0
Nov ..	34	0	1	7	23	9	2	11	3	28.7	33.0	32.0	31.2	82.2	63.2	75.5	73.6	14	9	7	2	1	10	0	0	0	0	0	0	0	0	0
Dec ..	38	2	1	8	12	3	5	18	5	9.7	12.7	11.1	11.2	81.1	71.1	80.2	77.5	15	15	11	13	20	28	0	0	0	0	0	0	0	0	0
Sums ..	276	53	34	185	245	40	46	138	41	450.0	488.2	487.6	475.1	1977.5	1740.7	1912.3	1876.9	120	157	89	127	56	122	11	30	2	.....	.....	.....	.....	.....	.....
Percentages.																																
Means ..	25.1	4.8	3.1	16.8	22.3	3.7	3.4	12.6	3.7	37.5	40.7	40.6	39.6	81.5	61.7	76.0	73.1	4.2	4.8	32.8	42.9	24.8	33.4	0.8	3.2	5	.....	.....	.....	.....	.....	.....

* For 13 days.

† For 16 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.44 a. m., 1.44 p. m., and 9.44 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .007 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.27; February, 1.27; March, 1.26; April, 1.21

May, 1.16; June, 1.14; July, 1.13; August, 1.14; September, 1.17; October, 1.20; November, 1.24; December, 1.29.

REMARKS.—January 5, coldest day on record.

ALEXANDER POLLAK
Sergeant, Signal Corps, U. S. A.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—					
	Number of calms.																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 82°.	Minimum below 82°.	Maximum above 90°.	Thunder-storms.	Auroras.	
1884.																										
Jan.....	7	11	4	15	21	12	13	10	0	10.0	12.6	11.7	11.4	66.6	63.4	66.9	65.6	0	8	23	23	18	31	0	0	0
Feb.....	7	14	1	19	16	4	12	14	0	21.3	23.0	21.0	21.8	75.1	73.1	74.0	74.1	0	8	27	24	8	24	0	0	0
Mar.....	14	11	3	17	10	6	16	15	1	22.9	26.0	24.6	24.5	76.5	75.4	76.9	76.9	0	15	12	17	8	20	0	0	0
Apr.....	21	9	4	6	8	5	12	22	3	32.5	32.4	33.9	32.9	77.9	69.4	76.7	74.7	4	13	13	11	0	3	0	0	0
May.....	9	4	2	19	15	9	25	8	2	44.1	44.7	45.2	44.7	77.4	68.5	78.2	74.0	8	13	10	16	0	0	2	0	0
June.....	16	12	3	4	23	6	18	5	3	56.4	55.6	57.3	56.4	78.3	62.8	79.9	73.7	6	15	9	16	0	0	1	3	0
July.....	10	4	0	7	18	5	38	11	1	57.0	57.3	57.5	57.3	81.9	71.2	82.1	78.4	6	17	8	10	0	0	5	1	0
Aug.....	10	4	1	18	21	10	17	11	1	57.1	56.5	57.0	56.9	78.1	59.4	74.5	70.7	3	15	10	6	0	0	2	5	0
Sept.....	9	4	1	18	23	10	14	10	1	53.2	54.1	54.0	53.8	77.1	60.8	73.6	70.5	4	8	16	6	0	0	1	4	0
Oct.....	9	2	1	22	22	10	16	11	0	40.2	41.4	40.7	40.8	75.4	65.6	75.1	72.0	4	11	16	16	0	3	0	8	1
Nov.....	5	4	8	20	14	13	19	11	1	27.8	31.5	28.9	29.4	76.6	73.0	74.7	74.8	4	4	23	17	2	15	0	0	0
Dec.....	4	4	0	26	23	14	11	11	0	20.7	23.3	22.4	22.1	81.5	78.6	81.7	80.6	2	5	24	17	12	22	0	0	0
Sums ..	120	83	23	191	214	104	211	139	13	443.2	458.4	454.2	452.0	922.4	819.2	913.5	885.0	70	123	173	176	48	118	4	22	7
	Percentages.																									
Means	10.9	7.6	2.1	17.4	19.5	9.5	19.2	12.7	1.2	36.9	38.2	37.8	37.6	76.9	68.3	76.1	73.8	19.1	33.6	47.3	48.1	13.1	32.2	1.1	6.0	1.9

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.02 a. m., 3.02 p. m., and 11.02 p. m., local time. Correction for instrumental error of barometer: From 7.02 a. m., January 1, to 11.02 p. m., December 31, 1884, inclusive, +.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January 0.88; February, 0.87; April, 0.87; May, 0.36; June, 0.35; July, 0.35; August, 0.35; September, 0.35; October, 0.36; November, 0.37; December, 0.38.

REMARKS.—Office was removed from Grant Block to room No. 33 on third floor of custom-house on August 1, 1884, at which time changes in the elevations of the instruments occurred as follows: Barometer, 30.500 feet higher in new than in old office. Thermometers: exposed, 39.483 feet higher from ground in new office; wet bulb, 39.483 feet higher from ground in new office; minimum, 39.739 feet higher from ground in new office; maximum, 38.680 feet higher from ground in new office.

JULIUS G. LINSLEY

Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PALESTINE, TEX.

Location of office on December 31, 1884, third floor I. and G. N. general office.

[Latitude, 31° 45' N.; longitude, 95° 40' W. Elevation of barometer above sea-level, 533 feet. Elevation of exposed thermometer above ground, 38 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	Total movement																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	7 p. m.		3 p. m.		11 p. m.	Date.		Lowest.		Range.		7 p. m.		3 p. m.		11 p. m.	Monthly mean.		Maximum.		Date.		Absolute range.				Mean maximum.		Total amount.		Largest amount.		Date.		Miles.		Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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* January.

† April.

‡ July.

REPORT OF THE CHIEF SIGNAL OFFICER.

415

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Number of calms.									Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.			7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.										3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.46 a. m., 1.46 p. m., and 9.46 p. m., local time.
Correction for instrumental error of barometer used: From 5.46 a. m., January 1, to 9.46 p. m., December 31, 1884, inclusive, —.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.580; February, 0.580; March, 0.570; April, 0.560; May, 0.550; June, 0.540; July, 0.540; August, 0.540; September, 0.530; October, 0.520; November, 0.510; December, 0.500.

JNO. A. GUZMAN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PENSACOLA, FLA.

Location of office on December 31, 1884, southwest corner Palafox and Saragossa streets.

[Latitude, 89° 30' N.; longitude, 87° 13' W. Elevation of barometer above sea-level, 30 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 33 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Washington time.			Monthly mean.			Washington time			Self-registering thermometer.			Total amount.			Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	7 p. m.	3 p. m.	11 p. m.	In.	In.	In.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.		Date.	Miles.	Direction from—		Date.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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† July.

† November.

* January.

PENSACOLA, FLA.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m.; Washington time: Number of times observed blowing from—							Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—													
	Number of calms.									Washington time.					Percentage.													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.			Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 50°.	Thunder-storms.	Auroras.	
1884.																												
Jan.....	28	19	9	12	5	2	15	0	35.3	37.5	36.8	36.5	77.4	62.6	71.7	70.6	5.7	5.4	5.8	6	14	11	0	12	0	1	0	
Feb.....	11	5	8	24	15	5	10	0	49.4	50.7	51.5	50.5	85.2	66.6	80.5	77.4	4.9	5.5	5.4	12	8	9	0	1	0	4	0	
Mar.....	11	6	4	17	24	15	5	10	54.0	54.6	54.6	55.1	85.6	67.0	82.8	78.5	5.5	5.8	5.9	6	14	11	0	0	0	3	0	
Apr.....	9	6	5	11	19	17	8	14	55.7	54.8	57.4	56.0	81.9	68.3	77.3	72.5	4.7	4.8	4.4	13	11	6	0	0	0	3	0	
May.....	8	5	3	19	12	32	4	10	68.4	65.8	66.5	66.2	87.0	64.9	82.2	78.0	4.3	5.3	3.0	14	10	7	0	0	0	8	0	
June.....	4	6	7	8	17	23	5	13	73.9	73.5	74.1	73.8	87.5	72.7	84.5	81.6	4.7	4.5	3.0	9	18	9	0	0	2	17	0	
July.....	9	2	2	3	16	31	18	5	73.9	73.5	74.1	73.8	87.5	72.7	84.5	81.6	4.7	4.5	3.0	9	18	9	0	0	0	20	0	
Aug.....	9	19	8	13	29	9	3	8	70.5	71.7	71.9	71.4	85.5	61.8	80.2	75.8	3.6	5.2	2.8	13	14	4	0	0	9	11	0	
Sept.....	3	15	18	27	12	3	2	0	70.6	71.0	71.7	71.1	87.0	63.1	79.1	77.1	2.6	4.8	1.2	7	0	0	0	0	4	3	0	
Oct.....	12	21	11	21	11	4	2	4	61.2	62.4	61.1	61.6	78.6	64.9	69.6	68.4	3.4	3.7	2.4	19	8	4	0	0	2	0	0	
Nov.....	35	18	7	4	8	3	1	7	43.2	46.3	44.8	44.8	75.7	62.6	67.7	65.3	3.9	3.9	2.9	15	11	4	0	0	0	0	0	
Dec.....	20	12	25	7	8	7	3	8	48.0	51.2	50.2	49.8	86.1	74.8	83.5	81.5	6.2	6.4	5.4	7	11	13	0	2	0	0	0	
Sums ..	159	134	103	166	177	155	60	101	697.2	708.1	712.4	705.9	1003.2	770.6	943.4	905.8	55.7	63.9	44.2	134	150	82	130	0	15	23	71	0
Means ..	Percentages.							Percentages.					Percentages.					Percentages.										
	14.5 12.2 9.3 15.1 16.1 14.2 5.5 9.2 3.9							58.1 59.0 59.4 58.8 83.6 64.2 78.6 75.5 4.6 5.3 3.7 4.5					38.6 41.0 22.4 35.5 0 4.1 6.3 10.4 0															

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6:19 a. m., 2:19 p. m., and 10:19 p. m., local time.
 Correction for instrumental error of barometer used: From 7 a. m., January 1 to 11 p. m., December 31, 1884, inclusive, + 0.04 inch.
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.080; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.
 REMARKS.—Last frost of spring, March 1; first frost of autumn, November 21.

M. MCGAURAN
 Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PHILADELPHIA, PA.

Location of office on December 31, 1884, post-office building.

[Latitude, 39° 57' N.; longitude, 75° 9' W. Elevation of barometer above sea-level, 117 feet. Elevation of exposed thermometer above ground, 174 feet. Elevation of rain-gauge above ground, 166 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.					
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Any consecutive hourly measurements.				Maximum hourly velocity during month.					
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometers.					Any consecutive hourly measurements.				Maximum hourly velocity during month.					
	7 p. m.	8 p. m.	11 p. m.	11 p. m.	7 p. m.	Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement	
1884.																														
Jan.	30.052	30.003	30.024	30.024	30.026	30.757	27	29.002	30.757	1.755	29.4	32.2	30.0	30.0	30.0	30.0	10.05	9	10.05	45.0	36.8	33.5	5.46	1.40	8	25	NW.	9	SW.	9 008
Feb.	30.061	30.050	30.002	30.071	30.024	30.824	16	29.169	30.824	1.655	38.6	43.0	39.4	41.3	40.5	35.0	6	10.5	29	54.5	47.4	45.8	5.70	1.06	23	35	NW.	29	NW.	9 239
Mar.	30.041	30.081	30.080	30.071	30.033	30.343	16	29.393	30.343	0.950	37.2	45.9	41.3	41.3	41.5	36.0	12	12.0	1	54.0	45.3	35.4	4.70	1.04	19	20	NW.	30	NW.	9 453
Apr.	30.076	30.070	30.073	30.073	30.053	30.106	12	29.097	30.106	1.009	44.8	46.4	46.4	46.4	47.4	40.7	37	43.0	4	46.4	57.3	60.8	1.63	.73	2	37	NW.	10	NW.	7 500
May	30.059	30.009	30.035	30.041	30.011	30.108	31	29.496	30.108	0.608	57.2	68.3	58.4	61.1	63.0	54.0	24	41.5	20	46.5	71.0	53.1	8.30	1.10	13	14	NW.	10	NW.	9 488
June	30.083	30.048	30.066	30.066	30.056	30.417	15	29.694	30.417	0.723	65.4	79.1	66.0	70.1	72.0	64.0	23	41.5	47	52.3	60.8	60.8	8.00	2.26	25	26	NW.	26	NW.	9 488
July	30.093	30.077	30.068	30.068	30.058	30.016	22	29.604	30.016	0.407	67.8	78.5	70.1	70.1	82.0	68.0	23	58.0	9	33.1	80.9	63.9	8.83	.70	4	32	NW.	4	NW.	9 488
Aug.	30.098	30.015	30.032	30.041	30.005	30.205	25	29.601	30.205	0.604	68.4	78.9	70.1	72.5	84.5	70.0	20	58.0	25	41.8	81.0	65.6	4.30	1.56	4	24	NW.	4	NW.	9 488
Sept.	30.029	30.015	30.007	30.007	30.000	30.391	14	29.634	30.391	0.764	64.8	74.1	66.0	66.0	70.6	64.7	4	31.7	18	52.0	67.5	68.8	1.20	.52	30	28	N.	3	N.	9 769
Oct.	30.063	30.096	30.045	30.038	30.037	30.477	26	29.633	30.477	0.834	52.3	64.3	58.0	62.1	68.7	54.3	4	22.0	25	43.9	52.5	52.5	2.31	1.01	22	24	NW.	6	NW.	9 769
Nov.	30.043	30.049	30.072	30.072	30.062	30.346	29	29.310	30.346	1.039	89.6	44.3	44.4	44.4	66.0	2	22.0	25	43.9	52.5	52.5	2.31	1.01	22	24	NW.	6	NW.	9 769	
Dec.	30.084	30.029	30.051	30.051	30.075	30.554	26	29.431	30.554	1.123	31.2	38.2	34.3	34.3	44.6	36.0	31	22.0	25	43.9	52.5	52.5	2.31	1.01	22	24	NW.	6	NW.	9 769
Sum.	30.043	30.048	30.048	30.048	30.048	30.757	27	29.002	30.757	1.755	59.2	71.7	62.1	62.1	64.3	56.0	31	22.0	25	43.9	52.5	52.5	2.31	1.01	22	24	NW.	6	NW.	9 769
Mean.	30.067	30.067	30.067	30.067	30.067	30.757	27	29.002	30.757	1.755	43.5	50.3	45.8	45.8	48.4	40.3	30	22.0	25	43.9	52.5	52.5	2.31	1.01	22	24	NW.	6	NW.	9 769

January.

August.

December.

PHILADELPHIA, PA.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time; Number of times observed blowing from—								Dew-point.		Relative humidity (per-cent.).		Cloudiness (in tenths).					Number of days—									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.			Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.		
									7 a. m.	8 p. m.	11 p. m.																
1894.																											
Jan.....	6	30	4	1	6	24	9	20	3	10.6	24.7	22.4	21.9	75.5	71.4	73.3	72.4	4.9	7.2	6.0	9	15	11	0	0	0	
Feb.....	7	26	3	4	18	14	10	17	1	35.1	37.5	34.7	34.2	87.5	73.4	78.4	78.8	5.8	6.2	6.0	16	16	1	0	0	0	
Mar.....	5	23	3	6	14	18	10	24	5	32.4	37.5	34.7	34.9	83.2	73.8	78.3	78.4	7.2	6.7	6.0	16	15	0	0	0	0	
Apr.....	6	18	4	6	12	14	4	41	1	30.6	46.3	42.6	42.8	83.1	74.3	87.0	81.5	4.7	7.3	4.1	10	10	0	0	0	0	
May.....	2	17	1	4	6	30	9	22	2	53.9	61.9	55.8	57.2	89.2	80.7	91.5	87.1	4.5	5.5	4.3	17	6	0	2	0	0	
June.....	7	29	3	5	13	22	3	6	2	60.6	67.7	62.2	63.5	84.9	70.0	85.2	80.0	4.1	4.6	2.3	17	5	0	0	0	0	
July.....	10	11	2	4	7	19	5	30	5	62.3	66.6	63.7	64.2	87.1	68.0	83.7	78.3	5.8	6.9	3.5	9	0	0	0	0	0	
Aug.....	14	17	2	6	43	7	5	6	3	72.8	63.8	64.7	63.8	82.9	61.8	83.5	76.1	5.5	6.0	3.5	13	0	0	0	0	0	
Sept.....	14	4	2	6	28	3	3	12	2	45.4	45.6	45.8	45.6	78.1	53.2	72.2	67.8	4.1	5.2	3.9	12	0	0	0	0	0	
Oct.....	32	8	3	2	18	6	6	9	5	31.6	33.0	34.2	32.9	73.5	55.4	74.2	67.7	4.8	5.2	4.2	12	9	0	0	0	0	
Nov.....	25	7	3	2	6	15	15	19	4	25.3	28.0	27.1	26.8	79.3	68.9	75.9	74.7	5.6	6.6	6.7	13	6	0	0	0	0	
Dec.....	14	15	3	2	6	15	15	19	4	25.3	28.0	27.1	26.8	79.3	68.9	75.9	74.7	5.6	6.6	6.7	13	6	0	0	0	0	
Sums..	144	190	35	54	157	172	82	275	30	527.0	505.6	543.6	546.1	981.2	798.9	937.9	912.7	60.0	72.8	52.0	109	133	21	70	23	0	
Means..	Percentages.								Percentages.																		
	13.1	17.8	3.2	4.9	14.3	15.7	7.5	20.5	3.6	43.9	47.1	45.5	45.5	81.8	68.6	73.8	76.1	5.0	6.1	4.3	29.8	34.8	5.7	12.1	3.3	6.3	0

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 7.08 a. m., 8.08 p. m., and 11.08 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1894, inclusive, $-.003$ inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.130 ; February, 0.130 ; March, 0.130 ; April, 0.130 ; May, 0.120 ; June, 0.120 ; July, 0.120 ; August, 0.120 ; September, 0.130 ; October, 0.130 ; November, 0.130 ; December, 0.130 .

REMARKS.—January, frosts, 14th, 21st, and 30th; February, frosts, 3d; lunar halo 3d; March, lunar halo 6th; April, office moved on the 1st; elevation of barometer changed from 92.119 feet to 117 feet; thermometer from 55 feet to 174 feet; rain-gauge, 108 feet to 166.5 feet; anemometer, 110 feet to 175 feet; August, lunar halo, 1st and 12th; frost, 21st and 22d; first snow of the season, 18th November; lunar halo 23d; frost, 24, 4th and 5th.

CHAS. N. KITCHEN,
Sergeant, Signal Corps, U. S. A.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 5.08 a. m., 1.08 p. m., and 9.08 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.043 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: **January, 12.70; February, 12.72; March, 12.59;**

12.28; May, 12.06; June, 11.82; July, 11.78; August, 11.79; September, 11.98; October, 12.28; November, 12.06; December, 12.66.

REMARKS.—Unusually bright coronæ, with a lunar halo on the 29th of December.

H. HALL,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PITTSBURG, PA.

Location of office on December 31, 1884, corner Fifth avenue and Wood street.

[Latitude, 40° 22' N.; longitude, 80° 2' W. Elevation of barometer above sea-level, 768 feet. Elevation of exposed thermometer above ground, 88 feet. Elevation of rain-gauge above ground, 86 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.						Precipitation.				Wind.				Total movement				
Washington time.														Washington time.						Self-registering ther- mometers.						Any 3 con- secutive 8-hourly measure- ments.			Maximum hourly velocity during month.		Prevailing direction.	
Month.	7 p. m.	8 p. m.	11 p. m.	Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	7 p. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Last amount.	Date.	Miles.	Direction.	Date.	W.					
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.					
Jan.....	29.221	29.268	29.284	29.241	29.267	27	28.619	8	1.278	21.8	28.1	24.9	24.9	62.8	31	6.0	5	58.8	32.2	15.2	4.82	2.24	8	30	SW.	2	SW.	5,903				
Feb.....	29.211	29.184	29.185	29.193	29.177	15	28.564	19	1.143	36.0	43.3	39.0	39.0	47.0	0	19	2.2	29	73.2	50.8	30.8	4.57	11	6	28	W.	20	S.	5,125			
Mar.....	29.204	29.173	29.185	29.187	29.187	16	28.694	28	.891	35.8	44.8	40.0	40.0	47.1	8	29	9.5	1	61.8	48.9	32.3	3.71	69	19	24	W.	12	NW.	5,215			
Apr.....	29.107	29.059	29.088	29.085	29.085	29	28.386	2	1.003	43.7	56.9	48.3	48.3	67.8	2	27	28.5	6	48.7	59.8	41.0	1.11	56	1,2	29	W.	2	NW.	5,276			
May.....	29.162	29.107	29.127	29.132	29.132	3	28.813	19	.673	54.1	71.4	59.7	62.4	91.5	23	38.0	29	52.5	74.8	51.9	3.48	85	26	27	24	SW.	2	NW.	4,913			
June.....	29.277	29.215	29.230	29.241	29.241	15	28.852	10	.746	66.1	81.9	70.0	72.7	96.0	21	50.3	15	44.7	86.8	62.3	1.71	.67	25	26	24	S.E.	7	NW.	3,236			
July.....	29.114	29.067	29.093	29.091	29.303	21	28.878	29	.425	65.6	80.5	68.8	71.7	97.2	23	52.2	17	45.0	84.7	61.7	4.04	1.41	25	29	22	W.	23	NW.	4,068			
Aug.....	29.260	29.212	29.230	29.237	29.444	9	28.871	30	.573	64.6	82.0	68.6	71.7	97.9	20	52.5	11	45.4	85.5	62.3	2.91	1.94	16	23	24	S.	21	NW.	3,444			
Sept.....	29.313	29.242	29.277	29.277	29.628	28	28.968	28	.660	61.0	81.9	67.6	70.4	96.8	10	43.6	21	56.2	85.4	59.4	1.17	.62	28	29	31	NW.	21	NW.	3,587			
Oct.....	29.354	29.303	29.318	29.325	29.672	25	28.975	8	.697	52.5	66.0	55.7	58.1	91.1	8	29.0	24	62.1	70.4	48.1	3.02	.53	27	29	31	NW.	8	NW.	4,046			
Nov.....	29.308	29.221	29.238	29.240	29.504	26	28.704	28	.877	58.6	43.8	40.8	42.7	98.8	4	18.9	24	50.9	53.3	34.0	1.18	.31	18	19	28	W.	23	W.	4,863			
Dec.....	29.302	29.227	29.236	29.238	29.571	26	28.667	9	1.037	31.4	38.8	32.8	34.3	67.2	5	2.0	19	69.2	43.7	23.4	4.07	.97	7	26	W.	9	W.	5,018				
Sums.....	290,802	290,810	290,810	290,810	290,810	10,008	673.8	724.4	616.2	638.0	683.5	5776.8	3,025.4	84.82	54,808		
Means.....	29.341	29.193	29.215	29.210	29.210	28.386	12	.834	47.8	60.4	51.4	53.2	298.5	110	6.0	55.7	64.7	43.8		

• January.

† April.

‡ September.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—							River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calm.	Washington time.				Clear.				Rain.	Cloudy.	(On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.														7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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* February.

† October.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.48 a. m., 2.48 p. m., and 10.48 p. m., local time. Corrections for instrumental error of barometer used: From 6.48 a. m., January 1, to 2.48 p. m., April 13, inclusive, +.006 inch. From 2.48 a. m., May 1, to 10.48 p. m., December 31, 1884, inclusive, +.006 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.850; February, 0.860; March, 0.860; April, 0.830; May, 0.800; June, 0.790; July, 0.790; August, 0.790; September, 0.790; October, 0.820; November, 0.850; December, 0.860.

REMARKS.—High water, February 1; flood, February 5 to 6, inclusive, highest water since 1892, 33 feet 4 inches; last snowfall of season, May 30; first frost of season, October 10; first killing frost and ice, October 24; heaviest snowfall of season, 18 inches, January 6; first snowfall of season, October 23; publication, June 29; polar halos, January 7, 13, March 13, May 11, June 5, July 3, 12, August 4, 30, and December 28; lunar corona, March 10, 12, April 7, 28, May 12, June 6, 8, 9, July 5, 7, 20, August 1, 31, September 3, October 2, 23, and December 5, 27, 29, 30; heavy rains, February 5, 6, 19, 20, March 12, 19, 28, April 1, May 5, July 24, 29, 31, August 16, September 17, and December 15.

C. L. BOZZELL, Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

POPLAR RIVER, MONT.

Location of office on December 31, 1884, post quarters.

[Latitude, 48° 8' N.; longitude 108° 10' W. Elevation of barometer above sea-level, 2,080 (B) feet. Elevation of exposed thermometer above ground, 4 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Washington time.				Monthly mean.	Higheest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Total amount.	Any 3 consecutive 8-hourly measurements.	Date.	Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	7 p.m.	3 p.m.	11 p.m.	Monthly mean.							Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.				Total amount.	Date.			Miles.	Direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In

Observations for 28 days.
Observations for 19 days.

Observations for 29 days.
Observations for 25 days.

August.
December.

POPLAR RIVER, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.			Washington time.			Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 320.	Minimum below 320.	Maximum above 300.	Thunder-storms.	Auroras.	
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.										11 p. m.	Mean.
1884.																								
Jan.	3	6	7	5	0	1	3	33	0	4—8.0	7.4—0.3	0	0	89.0	91.7	87.2	89.1	5.4	4	18	23	0	0	1
Feb.	5	7	28	0	0	3	30	30	5	3—13.6	0.3—0.4	0	0	89.0	91.7	87.2	89.1	5.4	4	18	23	0	0	1
Mar.	5	7	28	0	0	3	30	30	5	3—13.6	0.3—0.4	0	0	89.0	91.7	87.2	89.1	5.4	4	18	23	0	0	1
Apr.	5	7	28	0	0	3	30	30	5	3—13.6	0.3—0.4	0	0	89.0	91.7	87.2	89.1	5.4	4	18	23	0	0	1
May	5	7	28	0	0	3	30	30	5	3—13.6	0.3—0.4	0	0	89.0	91.7	87.2	89.1	5.4	4	18	23	0	0	1
June	7	6	20	5	19	2	30	15	2	51.3—45.8	42.9—41.0	33.7	33.7	75.6	73.5	67.1	68.3	4.7	9	13	25	0	0	1
July	7	6	20	5	28	2	15	15	2	51.3—45.8	42.9—41.0	33.7	33.7	75.6	73.5	67.1	68.3	4.7	9	13	25	0	0	1
Aug.	19	4	35	9	5	2	22	5	2	49.3—57.9	56.9—54.7	56.9	54.7	81.0	86.9	82.7	74.2	3.1	2	11	25	0	0	1
Sept.	17	9	12	11	8	10	23	6	2	48.4—61.4	56.6—54.6	56.6	54.6	73.9	84.3	74.3	69.7	4.3	2	11	25	0	0	1
Oct.	6	4	13	5	1	1	37	9	2	37.5—51.1	45.3—44.6	45.3	44.6	87.6	87.1	84.7	73.8	4.7	8	16	25	0	0	1
Nov.	15	2	6	10	9	6	30	9	2	27.0—42.6	35.9—32.3	35.9	32.3	87.0	86.9	80.2	77.4	4.7	8	16	25	0	0	1
Dec.	17	1	12	0	2	5	41	10	11	14.7—8.6	32.8—1.6	25.0—4.8	32.8	93.6	85.8	93.8	91.6	4.6	8	16	25	0	0	1
Sums	18	8	9	1	0	0	40	10	11	4—11	8.6—1.6	4.8—25.0	32.3—93.6	94.2	85.8	93.8	91.6	4.6	8	16	25	0	0	1

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.08 a. m., 1.08 p. m., and 9.08 p. m., local time. Correction for instrumental error of barometer used: From 7 a. m., October 1, to 11 p. m., December 31, 1884, inclusive, +.010 inob. The barometric observations may be reduced to sea-level by adding the following constants for the various months: October, 3.23; November, 2.23; December, 2.86.

GEO. A. GARDEN,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PORT HURON, MICH.

Location of office on December 31, 1884, City Hall building, corner Broad and Huron avenues.

[Latitude, 49° N.; longitude, 82° 20' W. Elevation of barometer above sea-level, 633 feet. Elevation of exposed thermometer above ground, 80 feet. Elevation of rain-gauge above ground, 63 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.		Wind.			Total movement.	
	Washington time.					Self-registering thermometers.					Any 3-consecutive 8-hourly measurements.	Date.	Direction from—	Maximum hourly velocity during month.	Date.	Prevailing direction.						
	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Range.	Highest.	Lowest.	Date.	Maximum.	Minimum.							Date.	Abnormal range.	Mean maximum.	Mean minimum.		Total amount.
1884.																					Miles.	
Jan.	29.376	29.344	29.358	29.369	1.307	29.420	29.309	27	29.420	1.307	29.420	29.309	29.420	29.309	29.420	1.307	29.420	29.309	29.420	29.309	29.420	9.301
Feb.	29.316	29.306	29.303	29.308	1.410	29.420	29.420	10	29.420	1.410	29.420	29.308	29.420	29.308	29.420	1.410	29.420	29.308	29.420	29.308	29.420	6.577
Mar.	29.325	29.319	29.318	29.321	1.036	29.420	29.321	20	29.420	1.036	29.420	29.321	29.420	29.321	29.420	1.036	29.420	29.321	29.420	29.321	29.420	7.690
Apr.	29.293	29.241	29.257	29.254	1.223	29.420	29.254	21	29.420	1.223	29.420	29.254	29.420	29.254	29.420	1.223	29.420	29.254	29.420	29.254	29.420	7.867
May	29.256	29.232	29.240	29.241	1.779	29.420	29.241	20	29.420	1.779	29.420	29.241	29.420	29.241	29.420	1.779	29.420	29.241	29.420	29.241	29.420	7.858
June	29.419	29.398	29.398	29.404	1.006	29.420	29.398	20	29.420	1.006	29.420	29.398	29.420	29.398	29.420	1.006	29.420	29.398	29.420	29.398	29.420	7.813
July	29.420	29.398	29.397	29.402	1.006	29.420	29.398	20	29.420	1.006	29.420	29.398	29.420	29.398	29.420	1.006	29.420	29.398	29.420	29.398	29.420	7.813
Aug.	29.365	29.321	29.344	29.347	1.255	29.420	29.347	28	29.420	1.255	29.420	29.347	29.420	29.347	29.420	1.255	29.420	29.347	29.420	29.347	29.420	7.813
Sept.	29.443	29.409	29.412	29.421	1.869	29.420	29.421	28	29.420	1.869	29.420	29.421	29.420	29.421	29.420	1.869	29.420	29.421	29.420	29.421	29.420	7.813
Oct.	29.346	29.320	29.321	29.345	1.862	29.420	29.321	23	29.420	1.862	29.420	29.321	29.420	29.321	29.420	1.862	29.420	29.321	29.420	29.321	29.420	7.813
Nov.	29.375	29.363	29.369	29.380	1.563	29.420	29.369	26	29.420	1.563	29.420	29.369	29.420	29.369	29.420	1.563	29.420	29.369	29.420	29.369	29.420	7.813
Dec.	29.375	29.363	29.369	29.380	1.563	29.420	29.369	26	29.420	1.563	29.420	29.369	29.420	29.369	29.420	1.563	29.420	29.369	29.420	29.369	29.420	7.813
Sums	352.029	351.897	352.010	351.907	11.725	491.7	590.0	516.2	532.9	532.9	532.9	532.9	532.9	532.9	532.9	532.9	532.9	532.9	532.9	532.9	532.9	82.441
Means	29.340	29.317	29.334	29.331	.977	41.0	49.2	43.0	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	8.241

• January.

! February.

! August.

! February.

PORT HURON, MICH.—Continued.

[illegible]

NOV.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.38 a. m., 2.38 p. m., and 10.38 p. m., local time.

NOTE.—1 a. m., 4 p. m., and 10 p. m.; Washington time, correspond to 5.55 a. m., 2.55 p. m., and 10.55 p. m., local time. Correction for instrumental error of barometer used: From 5.38 a. m., January 1, to 10.38 p. m., December 31, 1884, inclusive, $-.001$ inch.

The barometric observations may be reduced to sea-level by adding the following constants: January, 0.780; February, 0.780; March, 0.780;

REMARKS—Aurora April 24 from 10.50 p. m. to 11.45 p. m.; during August and September very dry; destructive forest fire September 15, 16, and 17; first frost August 24; last frost May 3.

M. H. PERRY,

III. H. L. BART, Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PORTLAND, ME.

Location of office on December 31, 1884, United States custom-house, corner Fore and Pearl streets.

[Latitude, 43° 39' N.; longitude, 70° 15' W. Elevation of barometer above sea-level, 45 feet. Elevation of exposed thermometer above ground, 28 feet. Elevation of rain-gauge above ground, 77 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.		Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Month.	Washington time.			Monthly mean.	Highest.	Lowest.	Range.	Washington time.				Self-registering thermometers.			Any 8 consecutive 8-hourly measurements.	Total amount.	Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	7 a. m.	3 p. m.	11 p. m.					7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.			Minimum.	Date.			Direction.	Miles.	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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* December.

† February.

‡ June.

PORTLAND, ME.—Continued.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 7.27 a. m., 3.27 p. m., and 11.27 p. m., local time.

NOVEMBER 2, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 1894. WASHINGTON, D. C. Correspond to 1.21 a. m., 5.31 p. m., and 11.27 p. m., local time. Correction for instrumental error of barometer used; From 7.27 a. m., January 1, to 11.27 p. m., December 31, 1894. Inclusive, +.001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.050; February, 0.050; March, 0.050; April, 0.050; May, 0.050; June, 0.050; July, 0.050; August, 0.050; September, 0.050; October, 0.050; November, 0.050; December, 0.050.

G. LIEBMANN,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PORTLAND, OREG.

Location of office on December 31, 1884, No. 48 First street.

[Latitude, 45° 32' N.; longitude, 123° 48' W. Elevation of barometer above sea-level, 87 feet. Elevation of exposed thermometer above ground, 45 feet. Elevation of rain-gauge above ground, 60 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	Washington time.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Range.	Highest.	Date.	Lowest.	Date.	Range.	Washing time.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.		Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.

* January.

† December.

‡ August.

§ February.

PORTLAND, OREG.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time; Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—						Dates.		Range.		Mean.									
	North. Northeast. Southeast. South. Southwest. West. Northwest.								7 a. m. 8 p. m. 11 p. m. Mean.				7 a. m. 8 p. m. 11 p. m. Mean.				Clear. Fair. Cloudy. On which .01 inch or more precipitation fell. Minimum below 32°. Maximum below 32°. Minimum above 32°. Thunderstorms.				Highest.		Lowest.		Date.															
Number of calms.								7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Minimum below 32°.	Maximum below 32°.	Minimum above 32°.	Thunderstorms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.											
Washington time.																																								
1884.																																								
Jan.....	10	6	15	7	21	9	2	7	20	82.0	81.4	82.0	81.8	84.5	69.5	78.3	77.4	4.9	6.1	4.5	4.5	9	10	12	13	0	13	0	0	8	10	24	8	2	4	8				
Feb.....	7	18	12	1	23	8	2	13	9	28.1	32.1	31.1	30.4	84.7	77.1	80.4	80.7	5.2	5.6	5.0	5.3	5	7	12	16	4	16	0	12	0	1	1	5	12	10	7	4	10	8	
Mar.....	6	7	9	1	24	11	9	13	13	35.5	37.1	38.4	37.0	84.3	63.3	74.3	74.1	6.7	6.8	6.0	6.2	10	13	15	0	1	1	0	0	7	1	3	5	21	3	8	4	8	4	
Apr.....	9	8	2	1	27	9	10	11	18	42.3	42.1	43.8	42.7	82.8	53.1	70.3	68.7	6.6	6.8	5.9	6.4	7	7	16	17	0	0	0	11	5	28	3	7	4	7	10	7	4	7	
May.....	11	2	0	2	27	6	10	29	13	45.3	45.6	47.7	46.2	81.6	49.8	60.4	63.9	4.8	4.9	4.3	4.5	11	11	9	11	0	0	0	0	18	5	31	8	11	4	9	6	13	1	3
June.....	26	0	0	2	30	4	8	11	14	49.6	49.6	53.4	50.9	80.9	53.1	67.9	67.3	7.7	6.4	6.6	6.9	4	8	18	16	0	0	0	120	2	14	15	17	11	2	8	1	11	11	
July.....	31	0	2	0	22	4	6	11	17	52.4	51.6	53.5	52.5	85.0	50.1	67.9	67.8	7.7	6.4	6.6	6.9	7	11	13	10	0	0	0	217	7	1	17	8	3	9	11	11	11	11	
Aug.....	34	2	1	3	8	3	8	24	16	53.7	53.2	54.9	53.9	84.7	48.4	58.5	63.9	1.9	2.4	2.7	2.7	19	8	4	8	0	0	0	3	0	10	7	8	2	8	4	0	6	6	
Sept.....	8	1	0	3	26	6	21	3	22	47.4	48.8	49.7	48.6	89.7	64.6	81.7	78.7	6.6	7.7	4.5	6.3	5	16	9	12	0	0	0	6	3	0	11	9	11	11	11	11	11	11	
Oct.....	7	0	1	3	28	15	6	10	23	44.4	45.7	46.6	45.6	92.1	60.3	80.6	82.6	6.2	7.3	4.5	6.0	8	11	12	17	0	0	0	5	0	11	9	11	11	11	11	11	11	11	
Nov.....	5	2	1	4	16	10	13	5	25	41.1	42.8	42.1	42.0	90.8	77.1	88.4	84.8	5.5	6.4	4.8	5.1	10	10	10	15	0	0	0	6	0	13	0	11	6	20	3	10	3	6	
Dec.....	7	2	81	5	14	10	3	4	17	24.7	25.2	25.0	25.0	83.5	73.0	79.0	78.5	6.6	7.6	6.4	6.9	5	11	15	21	9	23	0	9	0	23	1	23	15	7	10	3	11		
Sums ..	161	43	84	31	259	86	87	140	207	498.5	505.2	518.2	509.6	1024.6	755.2	890.8	890.0	69.7	74.3	59.7	67.8	100	123	148	166	18	53	3	8	.....	76	7	86	8	.....	.....		
Means ..	14	3.9	7.7	2.9	22.7	8.7	9.1	12.8	18.9	41.4	42.1	42.2	42.2	85.4	62.9	74.2	74.2	5.8	6.3	4.9	5.6	8.9	10.7	12.3	14.5	4.3	6.1	4.5	8	2°14	15	0	6	190	6	4	6
Percentages.																																								

* June.

† September.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 3.57 a. m., 11.57 a. m., and 7.57 p. m. local time. Correction for instrumental error of barometer used: From 2.37 a. m., January 1, to 1.57 p. m., December 31, 1884, inclusive — .033 inch. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

M. L. HEARNE,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PRESCOTT, ARIZ.

Location of office on December 31, 1884, post quarters.

[Latitude, 34° 33' N.; longitude, 112° 28' W. Elevation of barometer above sea-level, 5,239 feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 3 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.		Wind.		Total movement.											
	Washington time.			Monthly mean.	Date.	Lowest.	Date.	Range.	Washington time.			Monthly mean.	Self-registering thermometers.			Mean maximum.		Mean minimum.	Total amount.	Any 3 consecutive 8-hourly measurements.	Date.	Maximum hourly velocity during month.		Prevailing direction.				
	7 a. m.	3 p. m.	11 p. m.						7 a. m.	3 p. m.	11 p. m.		Date.	Minimum.	Date.							Absolute range.						
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.			
Jan.....	24.783	24.777	24.792	24.784	25.067	1	24.513	25	5.54	28.6	40.8	35.6	87.0	62.0	12 13.0	2	49.0	50.5	25.8	26	15	16	40	NE	10	SW.	4,269	
Feb.....	24.677	24.678	24.639	24.681	24.995	23	24.096	6	900	31.5	48.1	38.0	38.5	67.2	25 10.0	18	57.2	49.8	23.9	6.55	1.68	3	46	SW.	6	SW.	5,884	
Mar.....	24.613	24.611	24.639	24.631	24.890	13	24.320	23	560	33.6	48.0	40.9	40.8	63.0	14 20.0	21	43.0	52.1	31.9	5.51	1.10	45	45	SW.	16	SW.	6,238	
Apr.....	24.634	24.659	24.647	24.617	24.815	1	24.282	19 28	533	35.7	54.9	45.4	45.4	71.2	24 18.3	1	52.9	58.4	34.4	1.63	.45	16	44	S	12	SE.	6,275	
May.....	24.705	24.715	24.712	24.711	24.893	9	24.541	18 20	354	43.0	66.3	54.9	54.7	82.5	8 30.2	2	52.3	60.6	42.1	1.43	.74	1	80	SE.	13	SE.	5,083	
June.....	24.726	24.746	24.733	24.735	24.894	28	24.593	5	301	48.2	77.3	62.9	62.8	92.6	30 37.0	14	55.5	80.3	47.6	1.32	.22	6	81	S	15	SE.	5,028	
July.....	24.709	24.815	24.704	24.803	24.889	8	24.700	5 13	189	57.8	72.2	72.2	71.9	96.0	5 46.8	17	49.2	88.5	57.4	1.33	.71	7	80	S	18	SE.	4,815	
Aug.....	24.798	24.807	24.708	24.801	24.945	4	24.538	18	408	56.8	79.7	67.7	68.1	91.5	1 41.2	19	50.3	83.3	55.3	1.57	.55	1	34	SW.	16	SE.	3,893	
Sept.....	24.736	24.750	24.738	24.742	24.906	15	24.463	30	443	48.6	73.3	59.6	63.6	87.0	20 32.3	15	54.7	76.3	46.9	1.90	.64	2	34	SW.	7	SE.	4,774	
Oct.....	24.745	24.748	24.760	24.751	25.011	16	24.320	1	691	43.5	65.8	51.2	53.5	79.0	8 29.6	23	49.4	63.7	41.5	1.42	.61	23	37	S	1	SE.	4,174	
Nov.....	24.792	24.783	24.805	24.794	24.964	6	24.438	21	526	31.1	59.1	40.1	43.4	69.0	4 15.6	19	53.4	62.0	23.7	1.16	.16	21	23	S	8	SW.	2,137	
Dec.....	24.614	24.615	24.634	24.621	24.975	1	24.259	27	716	23.6	42.9	31.0	33.6	64.0	2 3	31	68.5	45.0	22.7	5.98	1.89	12	34	SE.	7	SW.	4,920	
Sums	296,673	296,736	294,742	294,701					6,175	483	2,745	9,599	8	610	2	15	4	531	635	4784	5463	236	75				56,954	
Means	24.715	24.728	24.728	24.725	25.067	+1	24.096	+6	515	40.4	62.2	50.0	50.9	96.0	15	4	531	53.0	65.4	33.6								

*January.

†February.

‡July.

§December.

PRESOTT, ARIZ.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.							Clear.	Fair.	Cloudy.	On which, 0.1 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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										7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.										Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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NOTE.—7 a. m. 3 p. m. and 11 p. m. Washington time, correspond to 4.38 a. m., 12.38 p. m. and 8.38 p. m., local time.

Correction for instrumental error of barometer used: From 4.38 a. m., January 1, to 8.38 p. m., December 31, 1884, inclusive, —.010 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 5.43; February, 5.41; March, 5.39; April, 5.27; May, 5.14; June, 5.03; July, 5.03; August, 5.02; September, 5.14; October, 5.20; November, 5.39; December, 5.42.

REMARKS.—Office moved March 18, 1884, and elevation of barometer eastern increased 49 feet. Thermometers changed March 18 from an elevation of 10 feet to 6.8 feet; rain-gauge from 3 feet to 3.2 feet.

JNO. GROVER,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

PROVINCETOWN, MASS.

Location of office on March 31, 1884, Center street, between Commercial and Bradford streets.

[Latitude, 42° 9' N.; longitude, 70° 11' W. Elevation of barometer above sea-level, 26 feet. Elevation of exposed thermometer above ground, 28 feet. Elevation of rain-gauge above ground, 35 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.								Precipitation.		Wind.			Total movement																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Washington time.				Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Self-registering thermometer.				Total amount.	Any 3 consecutive hourly measurements.	Miles.	Direction from—	Date.	Maximum hourly velocity during month.	Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	7 p. m.	8 p. m.	11 p. m.	Mean maximum.							Mean minimum.	Maximum.	Minimum.	Date.								Absolute range.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In

* One 11 p. m. observation missed.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.			Relative humidity (per cent.).			Cloudiness (in tenths).					Number of days—												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.			Mean.			7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Auroras.	
										7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.																		11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.
1884.																																	
Jan.....	15	5	5	7	7	17	17	17	3	21.5	22.6	22.7	22.3	80.2	73.4	73.6	77.4	6.6	7.2	6.8	5	11	15	16	15	26	12	1	0	0	0	0	
Feb.....	4	12	7	16	7	14	7	17	2	29.6	32.0	28.8	30.1	86.9	85.2	85.5	85.9	7.9	7.2	6.6	2	13	13	17	18	1	21	0	0	0	0	0	
Mar.....	8	10	5	9	10	12	12	27	0	27.6	28.5	28.2	28.8	83.4	73.5	83.0	80.0	7.1	7.5	5.4	4	13	14	21	5	18	5	1	0	0	0	0	
Apr.....																																	
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Sums.....																																	
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Percentages.									Percentages.																								

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 7.27 a. m., 8.27 p. m., and 11.27 p. m., local time.
 Correction for instrumental error of barometer used: From 7.27 a. m., January 1, to 11.27 p. m., March 31, 1884, inclusive, — .001 inch.
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.830; February, 0.830; March, 0.080.
 Station closed April 1.

C. N. KITCHEN,
 Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

RED BLUFF, CAL.

Location of office on December 31, 1884, corner Main and Pine streets.

[Latitude, 40° 10' N.; longitude, 123° 10' W. Elevation of barometer above sea-level, 333 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 20 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	Washington time.					Monthly mean.	Washington time.			Self-registering thermometers.	Mean maximum.	Mean minimum.	Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.	Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	7 P. M.	9 P. M.	11 P. M.	Range.	Date.		Lowest.	Date.	Highest.				Date.	Date.		Direction.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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† Unappreciable.

‡ February.

§ August.

|| March.

¶ January.

• Night observations missed.

RED BLUFF, CAL.—Continued.

Month.	Winds at 7 a. m. and 11 p. m.										Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—						Days.																			
	Washington time: Number of times observed blowing from—																Percentages.																									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.	11 p. m.	Mean.	7 a. m.	11 p. m.	Mean.	7 a. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which more precipitation fell.		Minimum below 80°.	Maximum above 90°.	Thunderstorms.																
1884.																																										
Jan.	66	0	0	0	0	0	0	0	0	33.2	36.5	37.9	39.5	41.1	73.8	74.8	75.8	76.8	77.8	15	10	8	0	0	0	0																
Feb.	50	0	1	0	0	0	0	0	0	40.9	41.6	43.2	44.0	45.8	73.8	74.8	75.8	76.8	77.8	12	10	4	0	0	0	0																
Mar.	33	0	1	0	0	0	0	0	0	45.9	44.7	43.2	42.0	40.8	73.8	74.8	75.8	76.8	77.8	13	10	4	0	0	0	0																
Apr.	20	1	2	4	1	3	11	5	50.0	49.1	52.4	50.5	48.4	40.7	57.5	55.2	52.9	50.7	48.5	12	11	5	0	0	0	0																
May	22	1	3	4	2	2	11	8	53.5	51.1	52.1	52.2	51.0	42.6	54.0	50.4	46.3	43.9	42.5	11	5	4	0	0	0	0																
June	18	1	3	7	4	0	2	11	48.7	47.2	47.2	48.0	46.5	25.6	30.2	28.8	26.1	23.6	21.0	28	8	7	0	0	0	0																
July	19	2	4	9	24	1	0	20	4	48.7	47.2	47.2	48.0	46.5	25.6	31.0	28.8	26.1	23.6	17	8	10	0	0	0	0																
Aug.	14	0	13	5	39	0	16	6	52.8	49.0	50.6	50.8	53.5	44.0	38.2	35.0	33.0	30.3	24	30	1	0	0	0	0																	
Sept.	33	1	8	1	20	0	0	13	43.8	42.0	43.1	43.0	45.4	37.7	31.5	28.1	25.4	22.9	24	9	9	0	0	0	0																	
Oct.	43	2	8	0	12	0	0	14	41.5	41.2	44.3	42.3	40.3	37.8	33.1	32.8	30.0	27.5	22	5	0	0	0	0	0																	
Nov.	48	0	1	10	2	0	0	17	40.0	40.3	41.4	40.6	38.5	35.4	33.9	32.8	31.4	29.8	24	8	0	0	0	0	0																	
Dec.	34	0	5	1	26	2	1	21	33.5	34.2	34.3	34.0	32.7	28.6	26.5	25.6	24.8	23.4	14	7	10	0	0	0	0																	
Sums	400	8	67	80	835	11	10	167	62	321	511	9	532	8	521	9	532	8	544	225	84	53	71	0	53	7																
	Percentages.																																									
Means.	36.7	0.6	3.2	3.9	7.1	0.0	9.1	3.6	43.4	42.7	44.4	43.5	74.9	45.4	57.6	50.3	2.7	3.4	2.3	6.2	3.3	2.4	6.1	0.0	0.4	1.4	5.1	9														

* For 23 days.

† April.

‡ January 2, 4, 5; August, 30, 31; September 1-3, 11-13, 25-30; October 1-13; December 5-17.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.50 a. m., 11.50 a. m., and 7.50 p. m., local time.

Correction for terrestrial refraction used: From Jan. 1, 1884, to Jan. 31, 1884, inclusive, +0.10 inch.

The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.370; February, 0.370; March, 0.370; April, 0.360; May, 0.350; June, 0.350; July, 0.340; August, 0.350; September, 0.350; October, 0.360; November, 0.370; December, 0.370.

REMARKS.—River-gauge carried away by high water, March 9; earthquake, 1 a. m. June 6; earthquake, 1 a. m. June 6; brilliant red sunsets, October 17-23, inclusive; cyclone, December 8.

J. R. WILLIAMS,

Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

RIO GRANDE CITY, TEX.

Location of office on December 31, 1884, Clay street, opposite Kelsey's warehouse.

Latitude, 26° 22' N.; longitude, 98° 49' W. Elevation of barometer above sea-level, 220 (B) feet. Elevation of exposed thermometer above ground, 4 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.					Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Washington time.					Washington time.					Self-registering thermometers.					Any 3 consecutive 8 hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Monthly mean.					Monthly mean.					Range.					Date.		Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	7 a. m.	3 p. m.	11 p. m.	Highest.	Lowest.	Date.	In.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.		Latest amount.		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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* Two 7 a. m., two 3 p. m., and two 11 p. m. observations missed.

January.

April.

July.

RIO GRANDE CITY, TEX.—Continued.

[illegible]

Three observations in April missed.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.33 a. m., 1.33 p. m., and 9.33 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884 inclusive, $+ .002$ inch, corresponding to 5.39 a. m., 1.93 p. m., and 6.39 p. m., local time.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.9

0.240; May, 0.240; June, 0.240; July, 0.230; August, 0.240; September, 0.240; October, 0.240; November, 0.250; December, 0.250.

REMARKS.—January 2, first and only frost during winter of 1883-'84. October 6, brilliant meteor 7.20 p. m. Office moved from Fort

elevation of thermometer above ground changed from 1.666 feet to 4.000 feet; elevation of top of rain-gauge above ground changed

1. The following table shows the number of people who attended the concert in each of the five years from 2000 to 2004.

Meteorological summary for the year ending December 31, 1884—Continued.

ROCHESTER, N. Y.

Location of office on December 31, 1884, Powers building.

[Latitude, 48° 8' N.; longitude, 77° 49' W. Elevation of barometer above sea-level, 621 feet. Elevation of exposed thermometer above ground, 149 feet. Elevation of rain-gauge above ground, 145 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipita tion.				Wind.				Total movement													
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Monthly mean.	Self-registering ther- mometers.			Mean maximum.	Mean minimum.	Total amount.	Any 2 con- secutive 8-hourly measre- ments.	Maximum hourly velocity during month.		Prevailing direction.															
	7 p. m.	3 p. m.	11 p. m.							Date.	Minimum.	Date.		Absolute range.	Date.	Direction from—					Miles.																	
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	7 p. m.	3 p. m.	11 p. m.	Monthly	Maximum.	Date.	Minimum.	Date.	Absolute	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Direction	Miles.	W.	W.	Miles.										
Jan	29.402	29.390	29.377	29.380	30.140	27	28.574	9	1.566	17.3	20.2	17.4	18.3	47.0	30.31	0	0	0	0	0	0	5.13	1.24	9	W.	44	W.	11,714										
Feb	29.346	29.336	29.360	29.349	29.929	15	28.721	28	1.208	25.4	23.8	24.9	23.5	453.5	5	0	0	0	0	0	0	1.94	533	29	W.	48	W.	9,841										
Mar	29.345	29.323	29.351	29.340	29.725	18	28.806	26	0.916	27.7	33.7	29.8	30.5	453.8	28	2	0	0	0	0	0	3.30	1,06	17	W.	48	W.	9,500										
Apr	29.254	29.224	29.253	29.244	29.736	21	28.571	2	1.165	37.5	44.8	40.9	41.1	175.5	8	27	27	8	0	0	0	0.44	50	9	W.	39	W.	8,079										
May	29.274	29.247	29.269	29.263	29.605	8	28.620	13	0.885	50.4	59.6	53.7	54.2	282.6	23	33.3	30	45	0	0	0	2.39	1,00	2	W.	28	W.	8,785										
June	29.453	29.412	29.417	29.427	29.837	15	29.044	9	0.793	62.2	73.0	63.7	67.1	182.1	24	48.6	10	38.5	77.2	57.1	2.38	1.20	1	NW.	24	SW.	8,043											
July	29.221	29.186	29.204	29.204	29.389	8	28.897	31	0.492	62.6	70.0	63.8	65.1	172.0	1	48.0	15	41.0	73.2	57.7	3.08	1.87	4	SW.	32	W.	7,492											
Aug	29.393	29.352	29.373	29.373	29.692	9	29.034	29	0.758	61.7	74.7	65.8	67.4	492.2	20	42.8	25	49.4	77.7	58.5	2.52	0.20	4	SW.	23	SW.	8,673											
Sept	29.419	29.380	29.408	29.401	29.836	14	29.023	28	0.834	80.0	71.4	65.0	64.3	392.1	7	37.8	18	54.3	76.6	54.1	1.90	0.82	24	SW.	16	SW.	7,611											
Oct	29.438	29.417	29.430	29.433	29.909	26	29.000	8	0.909	43.2	55.7	49.7	51.2	284.1	4	24.0	26	60.1	61.8	43.8	1.87	1.03	4	SW.	30	SW.	8,789											
Nov	29.502	29.518	29.537	29.546	29.790	3	29.765	29	0.965	34.0	40.6	35.8	36.8	64.9	10	15.4	24	48.5	48.5	30.8	1.22	0.44	28	W.	7	SW.	8,895											
Dec	29.416	29.388	29.409	29.404	29.006	26	28.630	6	1.368	27.8	31.4	28.5	28.1	164.9	31	10.5	20	75.4	38.2	22.4	2.03	0.83	21	W.	15	SW.	8,898											
Sum	302.559	305.361	307.302	303.211	303.164	11.679	512.7	602.9	537.5	565.1	8	542.0	601.3	448.8	831.17	
Means	29.392	29.328	29.351	29.347	29.847	20.140	28.571	43	0.773	43.8	50.8	44.8	46.0	492.2	120	10.5

* Total for 104 days only.

† For 351 days.

‡ January.

§ April.

|| August.

¶ December.

BOHNETER, N. Y.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	Number of calms.								7 a. m.				3 p. m.				11 p. m.				Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 59°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Mean.	7 a. m.	3 p. m.	11 p. m.											Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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Percentages.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.57 a. m., 2.57 p. m., and 10.57 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., March 31, inclusive, .000 inch; from 7 a. m., April 1, to 11 p. m., December 31, inclusive, +.023 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.710; February, 0.710; March, 0.700; April, 0.690; May, 0.680; June, 0.650; July, 0.630; August, 0.620; September, 0.650; October, 0.670; November, 0.700; December, 0.710.

REMARKS.—From 7 a. m., January 1, to 11 p. m., March 31, all barometer readings are too high, about .040 of an inch.

E. W. MCGANN
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

ROSEBURG, OREG.

Location of office on December 31, 1884, Jackson street, between Oak and Washington.

[Latitude, 43° 18' N.; longitude, 123° 20' W. Elevation of barometer above sea-level, 523 feet. Elevation of exposed thermometer above ground, 54 feet. Elevation of rain-gauge above ground, 46 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.				Wind.			
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Total amount.		Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.	
	7 p. m.	3 p. m.	11 p. m.	11 p. m.	Date.	Lowest.	Range.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Direction.	From—	Date.	Miles.
1884.																				
Jan.	29.585	29.580	29.555	29.567	29.971	10 28.799	1.172	84.5	39.9	39.163	9	25.0	16	38.8	45.3	34.0	SW.	8	7 8 28	28
Feb.	29.457	29.449	29.448	29.458	29.858	23 28.699	1.159	83.5	41.5	40.2	23	8.3	13	38.7	47.4	30.3	N.	18	15 16 20	20
Mar.	29.373	29.383	29.370	29.375	29.754	19 28.795	9	959	39.5	47.1	45.7	28	2	38.1	55.6	37.4	SW.	18	8 9 17	17
Apr.	29.404	29.395	29.392	29.397	29.728	8 28.981	10	707	45.2	51.4	7	85.2	18	43.8	61.2	43.6	SW.	23	9 10 28	28
May	29.472	29.447	29.435	29.451	29.699	1 29.134	19	535	47.8	56.5	31	85.0	4	38.2	71.8	48.6	N.	23	25 16	16
June	29.418	29.400	29.412	29.410	29.651	24 29.146	21	485	53.8	67.7	17	42.7	27	41.6	72.5	51.9	SW.	23	25 28	28
July	29.500	29.492	29.464	29.485	29.618	19 29.225	13	391	54.1	69.7	8	43.8	4	43.2	75.1	52.9	SW.	23	6 7 15	15
Aug.	29.448	29.413	29.406	29.422	29.601	6 29.159	2	442	55.8	70.4	2	46.0	15	51.2	85.5	54.3	N.E.	2	6 7 15	15
Sept.	29.500	29.492	29.464	29.485	29.618	19 29.225	13	391	54.1	69.7	8	43.8	4	43.2	75.1	52.9	N.W.	6	6 7 15	15
Oct.	29.500	29.492	29.464	29.485	29.618	19 29.225	13	391	54.1	69.7	8	43.8	4	43.2	75.1	52.9	N.W.	6	6 7 15	15
Nov.	29.539	29.549	29.543	29.544	29.793	30 29.280	9	513	43.8	47.4	4	38.8	30	39.9	53.0	41.2	N.W.	8	8 9 17	17
Dec.	29.877	29.898	29.885	29.887	29.858	7 29.696	25	1.107	35.8	37.6	18	19.2	10	42.5	45.7	31.1	SW.	16	16 17	17
Sums	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Means	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

¹ For 15 days only.

² For 11 days only.

³ For 94 days only.

⁴ One 9 p. m. and one 11 p. m. observation missed.

ROSEBURG, OREG.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time; Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Washington time.					Cloudiness (in tenths).			Number of days—														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.			3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.	Rain.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.	
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.															
1884.																																			
Jan.....	10	11	21	5	16	10	1	6	13	32.5	33.5	34.5	33.5	33.5	34.5	35.9	75.0	82.1	81.3	5.9	5.7	10	12	10	6	13	0	0	0	0	0	0	0		
Feb.....	12	8	7	1	10	11	4	15	27	32.5	31.9	33.9	32.3	32.3	33.9	30.1	73.1	73.2	73.1	5.3	5.2	12	10	13	5	2	0	0	0	0	0	0	0		
Mar.....	6	4	7	1	11	19	7	19	39	33.7	34.7	38.7	36.0	36.0	38.7	36.2	67.5	73.6	73.6	7.1	6.5	3	13	16	0	0	0	2	0	0	0	0	0		
Apr.....	9	4	8	1	8	11	6	19	24	41.1	41.3	43.4	42.9	42.9	46.1	40.1	64.8	74.2	74.2	7.0	6.7	4	18	17	0	0	0	0	0	0	0	0	0		
May.....	14	1	3	0	0	5	7	27	86	43.5	48.3	47.2	46.3	46.3	52.6	46.6	58.1	66.3	66.3	4.6	4.6	3	10	16	6	0	0	0	0	0	0	0	0	0	
June.....	18	3	4	2	6	4	1	29	28	43.5	51.2	50.3	50.0	50.0	55.7	56.1	63.8	69.2	67.7	6.8	6.7	3	11	16	0	0	0	0	0	0	0	0	0	0	
July.....	15	4	1	0	2	1	12	33	25	49.0	50.1	49.4	49.5	49.5	53.2	56.8	53.2	63.0	67.7	6.0	5.8	14	9	2	0	0	0	0	0	0	0	0	0	0	
Aug.....	8	0	1	0	0	1	4	22	18	50.0	51.9	52.0	51.3	51.3	58.1	58.6	47.9	55.9	55.9	2.0	1.3	21	10	0	1	0	0	0	0	0	0	0	0	0	
Sept.....	6	1	0	0	11	10	3	21	38	43.0	47.2	47.2	45.8	45.8	59.8	72.7	85.4	82.6	4.8	4.3	7	14	9	8	0	0	0	0	0	0	0	0	0	0	
Oct.....	4	8	3	2	5	5	4	18	49	41.9	45.3	44.5	43.9	43.9	94.8	81.6	89.1	88.5	2.4	2.8	9	17	5	9	0	0	0	0	0	0	0	0	0	0	
Nov.....	5	8	3	2	2	4	2	10	43	33.3	33.6	34.6	33.8	33.8	92.9	80.5	80.0	87.5	3.8	3.6	11	15	3	10	0	1	0	0	0	0	0	0	0	0	0
Dec.....	11	6	5	2	13	15	6	8	37	33.3	33.6	34.6	33.8	33.8	92.9	80.5	80.0	87.5	3.8	3.6	2	11	18	19	1	16	0	0	0	0	0	0	0	0	
Sums..	113	48	63	18	74	96	57	217	372												64.0	71.9	56.3	64.1	94	163	118	123	4	42	3	9	0	0	
Means.	Percentages.										Percentages.										Percentages.														
	10.7	4.5	5.9	1.7	7.0	9.1	5.4	20.5	38.2												5.3	6.0	4.7	5.3	25.7	41.9	32.3	34.6	11.1	10.9	12.5	0	0	0	

* Percentage for 383 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.55 a. m., 11.55 a. m., and 7.55 p. m., local time.

Corrections for instrumental error of barometer used: From 3.55 a. m., January 1, to 7.55 p. m., August 18, inclusive, +.001 inch; from 11.55 a. m., October 25, to 7.55 p. m., December 31, 1884, inclusive, +.001.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.580; February, 0.580; March, 0.570; April, 0.570; May, 0.569; June, 0.559; July, 0.550; August, 0.550; November, 0.536; December, 0.580.

REMARKS.—Re-establishing station; office destroyed by fire about 1.15 a. m., August 19; no observations of barometers or thermometers made during September; elevation of barometer changed from 511 feet, in old office, to 524 feet, in new office, October 25, 11.55 a. m.; elevation of thermometers changed from maximum 20 feet 9.4 inches, minimum 20 feet 11 inches, exposed 20 feet 5 inches, wet-bulb 20 feet 4 inches, in old office, to maximum 54 feet, minimum 54 feet 7 inches, exposed 53 feet 10 inches, wet-bulb 53 feet 10 inches, in new office; elevation of rain-gauge changed from 33 feet 4.4 inches, in old office, to 45 feet 6 inches in new office; no self-register in use since opening new office.

J. J. NANKY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SACRAMENTO, CAL.

Location of office on December 31, 1884, Lyon and Curtis Building.

[Latitude, 38° 35' N.; longitude, 121° 30' W. Elevation of barometer above sea-level, 64 feet. Elevation of exposed thermometer above ground, 32 feet. Elevation of rain-gauge above ground, 57 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement.							
	Washington time.					Washington time.					Self-registering thermometers.						Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.								
				Monthly mean.				Monthly mean.				Date.	Minimum.	Date.	Absolute range.	Mean maximum.		Mean minimum.	Total amount.	Direction from—			Miles.						
	7 a. m.	8 p. m.	11 p. m.		7 a. m.	8 p. m.	11 p. m.		Maximum.	Date.	Minimum.									Date.				Range.					
1884.	In.	In.	In.	In.	In.	Range.	Date.	Lowest.	Date.	Range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.	Maximum velocity during month.	Prevailing direction.
Jan.	30.100	30.106	30.064	30.060	30.510	9.76	26	29.514	26	9.76	41.8	50.6	48.0	46.6	61.0	22	31.0	11	36.0	55.9	37.9	I _a	I _v	20	30	SE	27	SE	4,379
Feb.	29.962	29.958	29.932	29.917	30.356	1.009	6	29.347	6	1.009	42.2	50.2	45.3	46.9	71.0	26	31.0	13	34.0	56.1	38.9	4.46	1.36	16	33	SE	17	N.	2,170
Mar.	29.886	29.914	29.885	29.893	30.226	1.787	6	29.439	6	1.787	48.6	56.2	45.8	52.9	70.5	1	39.0	12	31.9	60.7	48.7	8.14	2.94	8	30	SE	27	N.	6,787
Apr.	29.909	29.918	29.899	29.912	30.176	0.621	11	29.654	11	0.621	51.0	61.4	51.6	64.0	74.2	21	40.0	27	34.2	63.8	49.7	4.32	1.37	9	27	SE	10	SW.	2,609
May	29.895	29.906	29.897	29.894	30.047	0.969	18	29.061	18	0.969	57.0	70.2	64.9	64.0	83.0	18	50.5	6	34.5	73.4	58.7	1.06	.03	25	30	SE	21	SW.	2,772
June	29.869	29.896	29.862	29.876	30.075	0.721	12	29.703	12	0.721	58.7	72.2	68.9	65.8	92.0	18	52.9	13	39.1	72.3	57.6	1.45	.82	11	32	SW.	21	SW.	2,606
July	29.851	29.882	29.829	29.854	30.039	0.316	10	29.707	10	0.316	61.6	78.8	73.2	71.2	94.0	10	54.5	6	41.8	85.4	60.1	.00	.00	4	18	SW.	16	SW.	2,778
Aug.	29.813	29.813	29.794	29.817	30.018	0.359	10	29.659	10	0.359	63.1	80.9	72.5	72.5	100.0	8	54.0	18	46.0	88.7	60.8	.00	.00	4	18	SW.	16	SW.	2,384
Sept.	29.801	29.885	29.839	29.862	30.094	0.517	30	29.547	30	0.517	50.5	72.4	63.4	64.8	93.5	1	49.0	6	38.8	78.5	53.5	2.01	1.70	12	30	SW.	26	SW.	2,496
Oct.	29.913	29.934	29.904	29.917	30.122	0.449	26	29.673	9	0.449	52.6	69.0	61.0	59.9	90.5	8	42.0	6	38.8	72.1	49.6	2.01	1.70	12	30	NW.	12	SE, N.	2,486
Nov.	30.012	30.022	29.968	30.011	30.196	0.478	45	29.718	20	0.478	48.2	61.2	53.4	55.3	75.2	6	37.7	23	37.7	67.6	44.7	10.45	2.44	24	30	SE	13	N.	2,817
Dec.	29.896	29.901	29.884	29.894	30.228	0.807	25	29.421	25	0.807	44.8	51.7	49.8	48.8	65.0	1, 8	37.0	12	38.0	66.2	41.6	10.45	2.44	24	30	NW.	6	SE.	7,817
Yr. Mean	29.867	29.906	29.877	29.893	30.086	7.007	628	29.547	9	7.007	50.5	72.4	63.4	64.8	83.8	1	42.0	6	38.8	72.1	49.6	2.01	1.70	12	30	NW.	6	SE.	2,817
Yr. Mean	29.913	29.935	29.898	29.915	30.510	5.591	521	29.421	25	5.591	52.1	64.2	56.9	58.8	100.0	10	31.0	13	38.8	70.0	40.7	6.84	92	24	30	SE	6	SE.	8,611

! One 7 a. m. observation missed. * Inappreciable. * January. * February. * August.

SACRAMENTO, CAL.—Continued.

Month.	Winds at 7 a. m. 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—					River.																		
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.		11 p. m.		Mean.	7 a. m.		11 p. m.		Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Minimum below 32°.	Maximum above 32°.	Highest.	Date.	Lowest.	Date.	Range.	Mean.							
										7 a. m.	11 p. m.	7 a. m.	11 p. m.		7 a. m.	11 p. m.	7 a. m.	11 p. m.																				
1884.																																						
Jan.	20	4	3	12	1	17	1	13	8	38	2	42	0	41	9	40	7	80	1	73	4	13	10	8	2	0.13	6	31	7	10	5	23-25	9	8	9			
Feb.	21	3	2	14	6	14	1	13	1	39	4	30	4	41	7	40	5	86	7	70	8	10	6	7	2	0.17	7	18	10	1	15	7	6	13				
Mar.	22	2	2	14	17	4	8	2	6	44	7	48	4	45	4	45	2	86	7	68	2	13	7	10	13	0	0.22	6	15	4	0	8	4	9	21			
Apr.	4	0	5	16	25	28	5	6	1	47	1	48	1	49	5	48	3	86	9	62	5	12	7	10	9	0	0.23	20	22	19	9	7	8	9	21			
May	8	0	0	14	31	30	2	13	0	51	3	53	4	54	7	53	1	81	5	69	8	19	9	3	3	0	0.23	10	12	0	0	31	0	10	22			
June	1	0	8	13	39	23	3	10	1	53	1	56	5	55	7	55	7	81	7	68	7	18	5	6	7	0	0.22	0	11	4	0	30	2	8	20			
July	0	0	0	21	35	22	3	11	1	52	7	56	9	57	0	57	5	73	4	57	7	23	0	0	0	0	0.19	4	11	6	7	31	7	11	10			
Aug.	1	0	0	18	33	31	2	7	1	54	1	60	5	58	0	57	5	75	1	60	3	29	2	0	0	0	0.11	6	11	8	7	31	2	11	10			
Sept.	2	1	0	20	23	20	5	18	1	49	2	52	0	52	3	51	2	69	8	54	6	27	3	0	0	0	0.18	9	13	14	7	30	1	0	8			
Oct.	26	1	1	20	14	14	3	14	6	46	7	50	9	51	7	49	8	81	2	49	7	26	4	1	4	0	0.10	1	15	7	9	39	1	0	8			
Nov.	37	5	2	9	10	14	4	6	13	44	0	47	2	47	1	48	5	85	5	60	7	22	6	3	5	0	0.8	31	23	7	10	24-26	0	2	7			
Dec.	18	2	3	8	17	7	2	13	1	38	2	36	4	39	2	38	9	78	9	65	2	13	10	11	5	0.34	7	27	7	6	8-17	17	1	13	8			
Sums	149	18	22	220	267	213	38	132	36	558	7	502	7	504	2	541	8	984	3	722	0	589	5	848	7	31	298	68	57	69	13	22	61	8	170	2		
Means	12.6	1.6	2.0	20.1	24.4	19.4	3.5	12.1	3.3	46.6	49.4	49.5	48.5	82.0	60.2	70.0	70.7	65.6	18.7	71.5	93.0	9.34	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7

* December.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.02 a. m., 12.02 p. m., and 8.02 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 3 p. m., July 21, inclusive, —.001 inch. From 7 p. m., July 21, to 11 p. m., December 31, 1884, inclusive, +.003. (Extra barometer 244 used as station barometer on and after the 7 p. m. observation July 21.)

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

REMARKS.—Barometer reduction: Constant changed on and after February 1 from 0.080 to 0.070 of an inch for all months. Office moved from Arcade Building, 1006 Second street, to Lyon & Curtis Building, 117 I street, after the 11 p. m. observation of January 31, and before the 7 a. m. observation of February 1. Change in elevation of instruments as follows: viz: barometer cleptom, old elevation, 67.64 feet; new elevation, 67.64 feet; thermometer standard, old elevation, 37.10 feet; new elevation, 32.07 feet; rain-gauge elevation, 57.98 feet; new elevation, 54.65 feet. Old elevation used during January; new elevation used from February 1 to date. Last killing frost February 14, last light frost March 30; first killing frost December 9; first light frost October 1.

JAMES A. BARWICK, Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SAINT LOUIS, MO.

Location of office on December 31, 1884, United States custom-house.

[Latitude, 38° 38' N., longitude, 90° 12' W. Elevation of barometer above sea-level, 571 feet. Elevation of exposed thermometer above ground, 70 feet. Elevation of rain-gauge above ground, 90 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.				Total movement.																				
Washington time.					Washington time.					Self-registering thermometers.						Any 3 consecutive 8-hourly measurements.				Maximum hourly velocity during month.					Prevailing direction.																			
7 P. M.	9 P. M.	11 P. M.	Range.			Highest.	Lowest.	Date.	Monthly mean.	Maximum.	Date.	Minimum.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from.	Date.																							
																						Monthly mean.																						
																						In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
1884.																																												
Jan.	29.618	29.585	29.621	29.608	29.621	29.608	29.138	5	1.034	10	22.6	22.6	23.5	25.8	27.0	20	21.5	5	88.5	35.1	17.3	79.46	18	35	S.	30	S.	10,886																
Feb.	29.443	29.412	29.436	29.430	29.436	29.430	28.853	15	1.010	33.0	33.0	33.0	33.5	35.5	38.5	8	7.1	28	54.4	44.1	37.4	43.1	5.5	44	S.	4	N.W.	8,886																
Mar.	29.408	29.385	29.410	29.401	29.401	29.401	28.792	4	1.019	33.8	33.8	33.8	33.8	33.8	33.8	27	10.0	3	59.0	51.8	35.6	3.00	30	17	40	W.	11	N.	9,961															
Apr.	29.377	29.320	29.326	29.328	29.326	29.328	28.791	15	.817	48.3	48.3	48.3	48.3	48.3	48.3	30	34.1	10	49.2	62.6	46.5	4.15	90	14	40	N.W.	12	SE.	10,160															
May.	29.366	29.314	29.332	29.354	29.332	29.354	28.690	29	.683	58.7	58.7	58.7	58.7	58.7	58.7	10	44.0	2	42.0	72.8	56.4	2.68	87	1	40	S.W.	14	SE.	8,378															
June.	29.410	29.373	29.387	29.390	29.373	29.390	28.096	9	.479	68.3	68.3	68.3	68.3	68.3	68.3	22	52.5	10	42.5	81.9	66.4	4.52	153	2	37	N.W.	8	SE.	6,651															
July.	29.348	29.324	29.334	29.335	29.324	29.335	28.558	9	.435	72.9	72.9	72.9	72.9	72.9	72.9	23	65.0	14	23.0	86.3	70.9	2.86	27	28	40	W.	15	SE.	7,151															
Aug.	29.468	29.439	29.451	29.453	29.439	29.453	28.708	9	.563	68.4	68.4	68.4	68.4	68.4	68.4	19	54.0	9	37.5	83.2	67.3	1.21	43	27	36	N.W.	29	S.	7,411															
Sept.	29.443	29.404	29.423	29.425	29.404	29.425	28.680	20	.623	68.2	68.2	68.2	68.2	68.2	68.2	24	73.9	12	37.6	82.5	67.4	6.04	26	32	36	N.W.	19	S.	8,174															
Oct.	29.500	29.519	29.534	29.538	29.519	29.538	28.837	23	.590	56.6	56.6	56.6	56.6	56.6	56.6	5	33.9	23	53.6	72.1	55.5	2.43	1	36	36	N.W.	21	S.	7,590															
Nov.	29.526	29.482	29.507	29.505	29.482	29.505	28.941	6	1.053	41.9	41.9	41.9	41.9	41.9	41.9	1	13.0	24	62.8	56.1	37.8	2.80	73	3	40	W.	23	W.	8,318															
Dec.	29.535	29.496	29.513	29.512	29.496	29.512	28.916	18	1.190	31.2	31.2	31.2	31.2	31.2	31.2	4	7.0	19	73.8	41.2	26.1	6.18	1	47	40	W.	31	SE.	9,294															
Sum.	29.457	29.453	29.453	29.453	29.453	29.453	28.773	11	.522	60.8	60.8	60.8	60.8	60.8	60.8	4	31.5	53.6	63.1	67.2	57.0	0.40	64	27	40	W.	23	SE.	102,588															
Means	29.455	29.424	29.441	29.440	29.441	29.440	28.138	5	.794	50.7	50.7	50.4	54.9	55.8	55.0	123	31.5	53.6	64.4	43.0														

• January.

March.

June.

Meteorological summary for the year ending December 31, 1884—Continued.

SAINT MICHAEL'S, PORT, ALASKA.

[Latitude, 68° 29' N.; longitude, 161° 48' W. Elevation of barometer above sea-level, 80 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 1 foot.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Washington time.					Monthly mean.					Highest.					Self-registering thermometer.					Washington time.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	7 p. m.			3 p. m.		11 p. m.		Range.	Date.	Lowest.	Date.	Highest.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction.	From—	Maximum	Direction.	Total amount.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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SAINT MICHAEL'S, FORT, ALASKA—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—									Dew-point				Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 1.21 a. m., 9.21 a. m., and 5.21 p. m., local time.

Corrections for instrumental error of barometer used: From 1.21 a. m., January 1, to 5.21 p. m., December 31, 1885, inclusive, + .027 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.4; February, 0.4; March, 0.4; April, 0.3; May, 0.3; June, 0.3; July, 0.3; August, 0.3; September, 0.3; October, 0.3; November, 0.3; December, 0.4.

FRED. H. CLARKE
Corporal, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SAINT PAUL, MINN.

Location of office on December 31, 1884, Presley Block, No. 104 East Third street.

[Latitude, 44° 58' N.; longitude, 93° 3' W. Elevation of barometer above sea-level, 801 feet. Elevation of exposed thermometer above ground, 44 feet. Elevation of rain-gauge above ground, 61 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.		Wind.			Total movement																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Range.	Washington time.			Self-registering thermometers.			Total amount.	Any consecutive hourly measure-ments.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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December.

March.

June.

January.

SAINT PAUL, MINN.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time: Number of times observed blowing from—					Dew-point.	Relative humidity (per cent.).		Cloudiness (in tenths).	Number of days—					River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	North.	Northeast.	Southeast.	South.	Southwest.		West.	Northwest.		Number of calms.	Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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SAINT VINCENT, MINN.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 5.39 a. m., 1.39 p. m., and 9.39 p. m., local time.

Correction for instrumental error of barometer used: From 3.3 a. m., January 1, to 9.33 p. m., December 31, 1884, inclusive, + .001 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.860; February, 0.979; March, 0.940; April, 0.910; May, 0.869; June, 0.869; July, 0.840; August, 0.850; September, 0.870; October, 0.860; November, 0.860; December, 0.900.

REMARKS.—Meteor observed 7.30 p. m., January 21, moving from east to west, in the north. Solar halo, with parhelic circle, December 26. Last frost of spring, May 20; first frost of autumn, September 30.

W. H. FALLON,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SALT LAKE CITY, UTAH.

Location of office on December 31, 1884, Wasatch building, southeast corner of Main and Second South streets.

[Latitude, 40° 46' N.; longitude, 111° 54' W. Elevation of barometer above sea-level, 4,348 feet. Elevation of exposed thermometer above ground, 83 feet. Elevation of rain-gauge above ground, 78 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).				Temperature.				Precipitation.				Wind.		
	Washington time.		Monthly mean.		Washington time.		Self-registering thermometer.		Total amount.		Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.
	7 p. m.	3 p. m.	11 p. m.		Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Miles.	Direction.	
1884.															
Jan.	25.778	25.774	25.777	25.776	25.776	25.778	1	25.281	29	1.097	24.6	24.1	32	SE	W. S.E.
Feb.	25.597	25.593	25.590	25.593	25.593	25.621	22	24.916	6	1.105	27.9	22.5	32	NW.	SE.
Mar.	25.609	25.513	25.507	25.505	25.505	25.582	13	24.900	10	.883	28.4	23.1	32	NW.	SE.
Apr.	25.624	25.516	25.537	25.528	25.512	25.612	2	25.117	27	.685	42.6	34.5	34	NW.	SE.
May	25.604	25.603	25.595	25.601	25.604	25.604	7	25.381	21	.623	51.0	36.4	34	NW.	SE.
June	25.594	25.592	25.571	25.588	25.588	25.622	17	25.408	13	.413	60.2	37.9	34	NW.	SE.
July	25.625	25.628	25.588	25.613	25.613	25.639	8	25.407	13	.432	63.5	38.2	34	NW.	SE.
Aug.	25.603	25.604	25.590	25.599	25.599	25.622	29	25.386	18	.406	63.5	38.2	34	NW.	SE.
Sept.	25.603	25.601	25.587	25.590	25.590	25.610	30	25.100	30	.753	52.0	37.0	34	NW.	SE.
Oct.	25.605	25.618	25.608	25.613	25.613	25.613	16	25.431	1	1.042	47.1	36.4	34	NW.	SE.
Nov.	25.783	25.716	25.704	25.781	25.781	25.805	31	25.663	21	.868	36.1	30.4	34	NW.	SE.
Dec.	25.488	25.487	25.510	25.495	25.495	25.505	31	25.095	21	.890	52.2	36.4	34	NW.	SE.
Sum.	307.419	307.423	307.369	307.404	307.404	307.404	1	24.916	16	8.881	538.8	497.4	32	S.	SE.
Means	25.618	25.619	25.614	25.617	25.617	25.617	1	24.916	16	.749	44.7	38.0	32	S.	SE.

* January.

† February.

‡ July.

Meteorological summary for the year ending December 31, 1884—Continued.

SAN DIEGO, CAL.

Location of office on December 31, 1884, corner Fifth and D streets.

[Latitude, 32° 49' N.; longitude, 117° 10' W. Elevation of barometer above sea-level, 67 feet. Elevation of exposed thermometer above ground, 19 feet. Elevation of rain-gauge above ground, 80 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.		Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometer.	Total amount.	Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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* Inappreciable.

† January.

‡ February.

§ August.

|| December.

SAN DIEGO, CAL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—						Number of calms.	Dew-point.						Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	North.	Northeast.	East.	Southeast.	South.	Southwest.		West.	Northwest.	Washington time.				Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Part.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.20 a. m., 12.20 p. m., and 8.20 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, —.020 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

REMARKS.—March 25, last frost of season; March 26, hail-storm; April 27, hail-storm; October 22, desert wind; December 12, hail-storm; December 15, killing frost, first of season; no injury to crops.

J. C. SPRIGG, JR.,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SANDUSKY, OHIO.

Location of office on December 31, 1884, corner Water and Columbus streets.

[Latitude, 41° 30' N.; longitude, 82° 40' W. Elevation of barometer above sea-level, 639 feet. Elevation of exposed thermometer above ground, 54 feet. Elevation of rain-gauge above ground, 66 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.				Precipitation.				Wind.			
	Washington time.					Monthly mean.					Self-registering thermometer.					Any 3 consecutive 8-hourly measurements.		Total amount.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.
	7 p. m.	3 p. m.	11 p. m.	Range.	Date.	Lowest.	Highest.	Monthly mean.	Maximum.	Minimum.	Range.	Date.	Minimum.	Maximum.	Mean minimum.	Date.	Amount.		Direction from.	Miles.		
1884.																						
Jan.	29.433	29.395	29.450	29.426	30.044	28.750	30.264	29.507	29.523	29.523	30.107	5	29.523	30.107	29.523	12.9	1.25	39	84	SW.	2	8,675
Feb.	29.844	29.824	29.832	29.833	29.838	29.563	29.838	29.815	29.838	29.838	29.838	2	29.838	29.838	29.838	1.24	4.48	45	52	W.	20	7,804
Mar.	29.840	29.825	29.833	29.836	29.772	29.705	29.836	29.772	29.836	29.836	29.836	2	29.836	29.836	29.836	1.24	3.28	70	39	SW.	11	9,683
Apr.	29.281	29.258	29.253	29.251	29.654	29.555	29.654	29.604	29.654	29.654	29.654	3	29.654	29.654	29.654	1.50	9.22	41	20	N.	23	10,407
May.	29.285	29.255	29.271	29.270	29.640	29.594	29.640	29.619	29.640	29.640	29.640	3	29.640	29.640	29.640	1.50	8.70	71	42	N.	23	9,788
June.	29.405	29.371	29.369	29.382	29.708	29.576	29.708	29.640	29.708	29.708	29.708	10	29.708	29.708	29.708	2.43	1.82	9	44	N.	9	8,150
July.	29.243	29.222	29.225	29.280	29.455	29.007	29.455	29.340	29.455	29.455	29.455	9	29.455	29.455	29.455	5.75	1.64	31	41	NW.	6	7,847
Aug.	29.383	29.342	29.346	29.360	29.625	29.005	29.625	29.520	29.625	29.625	29.625	5	29.625	29.625	29.625	2.48	1.50	28	39	N.	7	7,588
Sept.	29.407	29.363	29.360	29.396	29.767	29.019	29.767	29.610	29.767	29.767	29.767	4	29.767	29.767	29.767	3.17	9.04	28	43	SW.	24	8,107
Oct.	29.470	29.430	29.430	29.446	29.694	29.038	29.694	29.578	29.694	29.694	29.694	2	29.694	29.694	29.694	1.16	8.85	27	49	N.	8	8,215
Nov.	29.381	29.354	29.353	29.376	29.548	29.038	29.548	29.419	29.548	29.548	29.548	14	29.548	29.548	29.548	1.01	8.83	23	44	W.	28	10,093
Dec.	29.430	29.392	29.425	29.412	29.623	29.026	29.623	29.520	29.623	29.623	29.623	19	29.623	29.623	29.623	2.44	1.63	6	45	W.	9	10,860
Sum.	292.381	292.011	292.293	292.332	292.506	291.561	292.506	292.2	292.506	292.506	292.506	11	292.506	292.506	292.506	63.7	63.6	63.7	63.7	63.7	63.7	107,767
Means.	29.363	29.334	29.363	29.381	29.044	29.055	29.381	29.381	29.381	29.381	29.381	19	29.381	29.381	29.381	60.3	60.3	60.3	60.3	60.3	60.3	107,767

• January.

† April.

‡ August.

§ December.

SANDUSKY, OHIO—Continued.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.38 a. m., 2.38 p. m., and 10.38 p. m., local time.

0.022 sec. m., and 1.1 p. m.
 Correction for instrumental error.
 Correction for atmospheric refraction.
 The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.720; February, 0.720; March, 0.730; April, 0.700; May, 0.670; June, 0.670; July, 0.690; August, 0.660; September, 0.680; October, 0.690; November, 0.720; December, 0.730.
 Corresponding times, correspond to 0.35 a. m., 2.38 p. m., and 10.38 p. m., December 31, 1884, inclusive, —.011 inch.

B. F. HOUGH,
Sergeant, Signal Corps. U. S.

Meteorological summary for the year ending December 31, 1884—Continued.

SANDY HOOK, N. J.

Location of office on December 31, 1884, Atlantic and Pacific Telegraph Company's building.

[Latitude, 40° 28' N.; longitude, 74° 0' W. Elevation of barometer above sea-level, 28 feet. Elevation of exposed thermometer above ground, 16 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.	Wind.		Total movement.								
Washington time.					Washington time.					Self-registering thermometers.					Mean maximum.					Mean minimum.					Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		
7 p. m.	8 p. m.	11 p. m.	Monthly mean.		Highest.	Date.	Lowest.	Date.	Range.	7 a. m.	8 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.		Date.	Miles.	Direction from—	Date.				
1884.																															
Jan.	30.142	30.089	30.113	30.115	30.832	27	29.116	9	1.716	25.5	29.9	27.6	27.7	50.0	0	9	8.0	6.7	42.0	33.6	21.2	9	4.76	2.95	8.9	58	E	8.9	W.	15,215	
Feb.	30.068	30.038	30.097	30.120	30.700	16	29.157	28	1.573	34.7	38.2	34.5	35.8	62.5	6	6.0	29	56.5	41.7	29.0	4.72	9.7	23	62	NW.	39	39	E	10,893		
Mar.	30.028	29.965	30.012	30.002	30.443	16	29.480	26	9.14	34.9	41.7	37.3	38.0	63.6	12	6.9	1	56.7	44.0	32.9	4.82	1.10	19	20	61	NW.	30	30	NW.	12,014	
Apr.	29.853	29.788	29.847	29.839	30.154	22	29.102	21	1.063	44.3	52.2	45.1	47.2	67.0	30	34.0	3	33.0	54.0	41.2	3.15	1.04	2.8	57	57	57	57	NW.	4	NW.	12,155
May	29.916	29.900	29.917	29.931	30.299	31	29.562	11	7.86	55.6	64.8	58.4	58.9	86.0	22	45.0	29	30	41.0	66.8	52.0	5.27	1.69	6.7	64	E	7	64	E	11,246	
June	30.083	30.021	30.081	30.065	30.523	15	29.724	9	7.80	65.0	73.8	68.5	68.4	91.2	21	51.3	1	39.9	75.7	61.4	4.59	3.82	25	50	E	26	26	S.	9,681		
July	29.865	29.814	29.839	29.839	29.904	26	29.583	13	4.35	67.6	75.6	69.5	71.0	80.6	23	58.7	30	30.2	77.4	64.8	6.42	1.65	4.6	49	NW.	23	23	S.	10,408		
Aug.	30.050	30.014	30.393	30.082	30.829	28	29.688	30	4.44	68.2	75.4	70.5	71.7	91.8	20	58.0	25	32.3	78.4	67.0	9	1.17	22	40	NW.	30	30	SW.	8,032		
Sept.	30.114	30.065	30.086	30.085	30.475	14	30.726	17	7.49	68.0	77.1	68.2	70.4	94.1	7	51.7	14	42.4	79.7	63.6	0.08	.02	30	39	NW.	13	13	SW.	9,740		
Oct.	30.153	30.083	30.125	30.120	30.570	26	29.707	8	8.93	53.7	82.4	55.6	57.2	81.1	1	35.1	26	46.0	68.5	49.9	4.21	1.61	30	31	NW.	18	18	NW.	12,831		
Nov.	30.084	30.041	30.050	30.060	30.452	8	29.494	28	9.86	41.4	48.2	43.8	44.5	62.4	23	22.1	25	40.3	51.8	37.8	3.57	1.20	28	29	NW.	24	24	W.	12,783		
Dec.	30.178	30.125	30.137	30.147	30.071	27	29.555	6	1.136	33.9	38.3	36.2	36.1	61.8	31	0.8	30	60.5	43.6	29.9	5.64	1.78	21	60	N.	19	19	N.	12,661		
Sum.	300.562	299.963	300.360	300.292	300.622	277	29.102	12	11.618	591.8	677.9	611.2	628.9	94.1	77	0.8	320.8	712.3	500.0	58.78
Means	30.047	30.007	30.028	30.024	30.024	277	29.102	12	11.618	591.8	677.9	611.2	628.9	94.1	77	0.8	320.8	712.3	500.0	58.78

* January.

† April.

‡ September.

§ December.

SANDY HOOK, N. J.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	7 a. m.		11 p. m.		Mean.	7 a. m.		11 p. m.		Mean.	Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
										7 a. m.	3 p. m.	11 p. m.	3 p. m.		7 a. m.	11 p. m.	3 p. m.	7 a. m.											11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.	3 p. m.	7 a. m.	11 p. m.

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 7.12 a. m., 3.12 p. m., and 11.12 p. m., local time.

Correction for instrumental error of barometer used: From 7.12 a. m., January 1, to 11.12 p. m., December 31, 1884, inclusive, +.012 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.030; February, 0.030; March, 0.030; April, 0.030; May, 0.030; June, 0.030; July, 0.030; August, 0.030; September, 0.030; October, 0.030; November, 0.030; December, 0.030.

REMARKS.—February 22, last frost; March 6, last snow; August 10, 2.05 p. m., decided earthquake shock; October 15, first frost; October 24, first killing frost; December 18, first snow.

J. McN. WRIGHT,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SANFORD, FLA.

Location of office on December 31, 1884, De Forest building.

[Latitude, 28° 49' N.; longitude, 81° 29' W. Elevation of barometer above sea level, 38 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 35 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.				Precipitation.		Wind.				Total movement.				
Washington time.				Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.		Total amount.	Any 8 consecutive 8-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.							
7 p. m.	3 p. m.	11 p. m.	Monthly mean.							Date.	Lowest.	Date.	Range.	7 a. m.	3 p. m.			11 p. m.	Monthly mean.	Maximum.		Date.	Minimum.		Date.	Absolute range.	Mean maximum.	Mean minimum.	Largest amount.	Date.	Miles.	Direction from—	Date.
1884.																												
Jan	30.150	30.127	30.174	30.160	30.488	21	29.754	8	.764	50.0	63.5	53.2	55.6	61.5	24	28.5	21	53.0	66.3	46.4	.91	50	19	26	N.W.	8	5,972	
Feb	30.098	30.035	30.085	30.073	30.278	10	29.694	28	.584	59.9	73.8	62.2	65.3	63.5	19	40.4	29	43.1	75.6	57.0	4.40	50	16	28	N.W.	19	4,530	
Mar	30.078	30.006	30.055	30.046	30.303	4	29.806	26	.497	63.0	77.0	65.1	68.3	68.5	25	43.0	1.3	45.5	78.0	60.0	.94	58	26	26	N.W.	19	5,451	
Apr	29.963	29.890	29.947	29.933	30.149	29	29.583	6	.566	65.1	78.7	65.4	69.7	69.1	30	49.0	25	42.5	80.9	60.7	1.90	90	6	28	N.W.	6	5,065	
May	29.977	29.911	29.956	29.948	30.106	3	29.773	28	.303	74.0	85.3	71.4	76.9	74.7	29	63.2	8.10	31.5	88.3	67.3	1.69	72	5	31	N.W.	30	4,731	
June	29.971	29.914	29.935	29.930	30.087	27	29.773	11	.314	75.5	81.9	72.9	76.8	74.8	27	62.6	2	32.2	87.2	68.7	9.57	85	10	11	N.E.	6	4,627	
July	29.963	29.914	29.945	29.942	30.068	24	29.794	8	.274	78.5	87.7	77.7	81.9	79.6	1	69.8	5	27.6	92.6	73.8	6.57	103	21	28	N.W.	20	3,704	
Aug	29.977	29.925	29.977	29.960	30.112	19	29.788	30	.324	76.7	86.7	76.6	80.0	78.6	1	70.1	31	29.5	92.0	74.2	11.09	124	16	28	N.E.	26	3,209	
Sept	29.965	29.947	29.987	29.976	30.145	26	29.806	9	.339	76.4	82.7	76.0	78.4	76.4	11	64.0	17	30.8	88.7	71.5	3.83	111	14	28	N.E.	14	4,807	
Oct	30.014	29.989	30.012	30.005	30.210	20	29.815	9	.425	71.8	80.3	71.2	74.9	73.4	9	55.5	18	38.5	94.5	66.1	3.02	176	20	21	N.E.	15	6,188	
Nov	30.048	29.983	30.032	30.021	30.148	24	29.887	28	.461	63.0	73.8	63.8	66.9	65.5	1	44.4	25	41.1	76.9	58.8	1.45	158	28	28	N.	19	4,684	
Dec	30.110	30.040	30.092	30.081	30.280	19	29.830	6	.430	62.2	71.9	62.3	65.6	64.6	12	37.4	3	47.2	74.5	54.3	2.51	146	6	20	N.	19	3,735	
Sums	360.374	359.691	360.220	360.085	360.468	21	29.563	16	5.371	816.1	943.8	817.8	859.2	839.2	16	38.5	459	5,998	5,756	8.46	81	50,103
Means	30.081	30.074	30.018	30.008	30.468	21	29.563	16	.448	68.0	78.6	68.2	71.6	69.7	16	38.5	21	38.8	82.2	63.1

• January.

† April.

‡ July.

REPORT OF THE CHIEF SIGNAL OFFICER.

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Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time; Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.				Washington time.				Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.	
									7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.										7 a. m.	8 p. m.	11 p. m.	Mean.
1884.																										
Jan.....	9	17	2	7	7	16	3	30	46.7	50.0	43.3	48.3	88.4	62.7	83.4	78.2	5.1	5.6	2.9	4.5	0	0	0	0		
Feb.....	3	16	2	22	9	15	13	5	56.3	56.0	56.6	56.3	88.3	54.5	82.2	75.0	4.4	4.0	2.6	3.7	0	0	0	0		
Mar.....	4	9	3	18	8	23	5	7	57.6	58.8	59.3	58.6	83.0	54.5	81.1	72.9	3.7	5.4	2.9	4.0	0	0	0	0		
Apr.....	0	6	0	11	7	37	4	21	58.2	56.0	56.1	57.5	79.2	47.9	77.9	68.3	3.0	4.0	1.1	2.7	0	0	0	0		
May.....	2	14	10	9	5	23	18	10	67.8	64.1	66.1	65.7	81.4	51.7	80.9	71.3	3.7	5.0	1.5	3.4	0	0	0	0		
June.....	0	12	32	11	5	18	9	8	70.0	68.3	68.6	69.0	83.6	65.6	84.6	78.6	5.0	7.6	3.2	5.3	0	0	0	0		
July.....	2	10	3	4	10	28	28	8	72.2	73.0	73.2	72.8	81.6	63.7	86.7	77.2	2.8	7.3	1.8	4.0	0	0	0	0		
Aug.....	9	38	15	5	8	9	11	2	73.4	71.2	72.5	72.4	90.4	63.0	88.8	83.4	2.5	6.5	2.4	3.8	0	0	0	0		
Sept.....	10	38	13	0	5	12	6	0	68.3	66.2	67.3	68.6	83.0	63.4	87.6	78.0	4.2	7.3	3.2	4.9	0	0	0	0		
Oct.....	23	42	9	3	0	1	3	12	58.6	61.8	58.8	59.7	84.4	71.0	84.3	80.6	3.2	5.8	2.1	3.7	0	0	0	0		
Nov.....	32	20	7	5	5	9	8	11	57.3	53.5	58.6	58.1	84.9	64.4	87.7	79.0	5.5	6.5	5.1	5.7	0	0	0	0		
Dec.....	21	14	15						57.3	53.5	58.6	58.1	84.9	64.4	87.7	79.0	5.5	6.5	5.1	5.7	0	0	0	0		
Sums ..	115	237	101	103	79	200	94	148	758.1	756.5	758.6	757.8	1020.6	735.4	1013.4	923.2	48.7	70.5	32.2	50.5	0	4	87	55	0	
Means .	10.521	6.2	9.4	7.213	2.8	6.13	5.1	9	63.2	63.0	63.2	63.1	85.0	61.3	84.4	78.9	4.1	5.9	2.7	4.2	35.8	52.2	12.0	40.7	0	1.123.813.0
									Percentages.				Percentages.				Percentages.									

NOTE.—7 a. m., 3 p. m., and 11 p. m.; Washington time, correspond to 6.43 a. m., 2.43 p. m., and 10.43 p. m. local time.

Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 7 a. m., May 18, inclusive, +.014 inch; from 11 a. m., May 19, to 11 p. m., December 31, 1884, inclusive, +.024 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.040; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

REMARKS.—A small water-spout occurred over Lake Monroe on July 20; a gale of 64 miles per hour, north, occurred on October 15; the last frost of the season occurred on January 22; the first frost of the season occurred on December 3.

The office was moved from the Sanford House to the De Forest building between 11 p. m., July 31, and 7 a. m., August 1, 1884, changing the elevation of barometers 14 feet lower, thermometers 15.1 feet lower, and rain-gauge 6.6 feet lower.

J. H. MELTON,
Corporal, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SAN FRANCISCO, CAL.

Location of office on December 31, 1884, Merchants' Exchange building, No. 431 California street.

[Latitude, 37° 48' N.; longitude, 122° 20' W. Elevation of barometer above sea-level, 80 feet. Elevation of exposed thermometer above ground, 45 feet. Elevation of rain-gauge above ground, 68 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).						Temperature.						Precipitation.				Wind.			
	Washington time.			Monthly mean.			Washington time.			Self-registering thermometers.			Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.		Total movement.	
	7 p. m.	3 p. m.	11 p. m.	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction.	Date.	Miles.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
1884.																				
Jan.	30.080	30.090	30.090	30.077	30.477	30.541	30.086	47.6	51.5	50.8	50.0	58.5	5.14	43.0	24	15.8	54.7	45.6	29	28
Feb.	30.048	30.084	30.084	30.083	30.350	30.374	15	47.6	52.7	50.4	50.0	58.5	7.10	35.0	26	15.8	55.0	45.6	17	5
Mar.	30.078	30.077	30.077	30.088	30.224	30.460	9	78.4	51.6	53.8	54.0	68.5	8.45	0	28	23.5	59.2	49.8	15	16
Apr.	30.090	30.092	30.092	30.091	30.171	30.514	10	45.7	51.9	53.8	54.0	68.5	8.45	0	28	23.5	59.2	49.8	15	16
May	30.090	30.092	30.092	30.091	30.171	30.514	10	45.7	51.9	53.8	54.0	68.5	8.45	0	28	23.5	59.2	49.8	15	16
June	30.090	30.092	30.092	30.091	30.171	30.514	10	45.7	51.9	53.8	54.0	68.5	8.45	0	28	23.5	59.2	49.8	15	16
July	30.090	30.092	30.092	30.091	30.171	30.514	10	45.7	51.9	53.8	54.0	68.5	8.45	0	28	23.5	59.2	49.8	15	16
Aug.	30.090	30.092	30.092	30.091	30.171	30.514	10	45.7	51.9	53.8	54.0	68.5	8.45	0	28	23.5	59.2	49.8	15	16
Sept.	30.090	30.092	30.092	30.091	30.171	30.514	10	45.7	51.9	53.8	54.0	68.5	8.45	0	28	23.5	59.2	49.8	15	16
Oct.	30.090	30.092	30.092	30.091	30.171	30.514	10	45.7	51.9	53.8	54.0	68.5	8.45	0	28	23.5	59.2	49.8	15	16
Nov.	30.090	30.092	30.092	30.091	30.171	30.514	10	45.7	51.9	53.8	54.0	68.5	8.45	0	28	23.5	59.2	49.8	15	16
Dec.	30.090	30.092	30.092	30.091	30.171	30.514	10	45.7	51.9	53.8	54.0	68.5	8.45	0	28	23.5	59.2	49.8	15	16
Sum.	30.090	30.092	30.092	30.091	30.171	30.514	10	45.7	51.9	53.8	54.0	68.5	8.45	0	28	23.5	59.2	49.8	15	16
Means	30.090	30.092	30.092	30.091	30.171	30.514	10	45.7	51.9	53.8	54.0	68.5	8.45	0	28	23.5	59.2	49.8	15	16

* One 7 a. m. observation missed.

January.

February.

July.

Insupportable.

SAN FRANCISCO, CAL.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—						Dew-point		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—														
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Washington time.				Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.	Thunder-storms.	Aurora.								
									7 a. m.	8 p. m.	11 p. m.	Mean.										7 a. m.	8 p. m.	11 p. m.	Mean.				
1884.																													
Jan.....	16	15	4	17	12	4	7	15	3	42.0	44.2	45.5	44.5	87.2	77.3	82.5	82.3	5.1	6.1	4.0	5.1	8	16	7	10	0	0	0	
Feb.....	8	20	7	10	6	7	11	16	2	43.8	41.9	43.6	42.5	83.1	68.1	78.6	76.6	5.3	5.5	3.3	4.7	9	11	9	15	0	0	0	
Mar.....	10	6	4	12	9	11	20	18	3	46.7	47.5	47.0	47.1	83.9	72.5	78.2	78.2	5.9	6.5	5.1	5.8	6	11	14	16	0	0	0	
Apr.....	0	1	4	9	11	19	28	14	4	47.6	48.2	48.5	48.4	85.7	70.8	80.8	79.1	3.9	6.4	3.9	4.7	10	13	7	10	0	0	0	
May.....	0	0	0	2	3	27	45	14	2	50.2	50.2	50.3	50.2	86.1	63.5	78.5	76.0	5.6	5.7	4.6	5.3	7	17	7	10	0	0	0	
June.....	2	0	0	6	3	33	40	3	5	52.5	52.9	52.6	52.6	88.2	60.6	81.8	79.9	6.6	5.7	5.7	6.0	8	17	7	10	0	0	0	
July.....	0	0	0	0	2	48	34	4	6	52.2	53.1	52.6	52.6	88.1	65.4	80.8	77.9	5.7	2.2	3.7	3.9	14	12	6	0	0	0	0	
Aug.....	0	0	0	1	0	54	37	0	1	52.9	54.1	53.5	53.5	91.5	71.4	87.9	83.6	7.6	2.5	3.2	5.4	14	20	7	1	0	0	0	
Sept.....	1	1	0	2	4	28	18	21	4	51.7	52.8	51.9	52.1	90.1	73.0	83.4	81.0	5.1	1.9	2.1	3.6	20	7	8	3	0	0	0	
Oct.....	6	5	1	10	2	26	16	11	23	51.2	52.0	51.9	52.0	91.5	76.5	85.5	84.5	5.1	2.9	2.7	3.6	13	14	4	0	0	0	0	
Nov.....	4	11	4	10	5	16	11	23	3	50.5	50.5	50.5	50.5	88.8	73.7	80.7	81.0	4.2	4.7	2.1	2.7	15	12	8	2	0	0	0	
Dec.....	14	10	5	18	9	18	4	12	3	43.2	43.4	44.9	43.5	77.9	66.7	78.5	73.7	5.7	5.4	5.1	5.4	10	8	13	0	0	0	0	
Sums.....	61	60	29	97	66	291	239	146	40	384.6	391.7	392.5	389.5	1042.1	846.0	974.7	954.2	64.0	55.5	48.5	56.0	124	148	93	83	0	0	3	
Means.....	5.6	6.3	2.6	8.6	6.0	26.5	27.2	13.3	3.6	48.7	49.3	49.4	49.1	86.8	70.5	81.2	79.5	5.3	4.6	4.0	4.6	34.0	40.5	23.5	22.7	0	0	0.0	0
Percentages.																													

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.58 a. m., 11.58 p. m., and 7.58 a. m. local time. Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, + .039.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.070; June, 0.070; July, 0.070; August, 0.070; September, 0.070; October, 0.070; November, 0.070; December, 0.070.

Remains.—January, rainbows 34 and 27th; first killing frost of season, 11th; hail 27th; ice 15th and 17th; lightning 24th; February, hail 5th; sleet 6th; snow 6th and 7th; March, earthquake shocks 25th; hail 25th, 26th, 27th, and 28th; thunder-storm 25th; last frost 9th; April, lightning 24th; heavy rain-storm 11th; May, thunder-storm 17th; lightning 18th; June, large monthly rainfall, exceeding any previous record for June by over 1.50 inches; July, earthquake shock 15th; September, lightning 4th, 12th, 13th, and 14th; October, first light frost 24; mirage 8th; lightning 24th; heavy rain-storms 20th and 23d; December, first killing frost 12th; severe northern 6th and 7th; thunder-storm 23th; lightning 24th; ice 12th, 13th, 24th, and 30th; heavy rain-storms 20th and 23d.

NELSON GOROM

Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SANTA FE, N. MEX. *

Location of office on December 31, 1884, No. 48 San Francisco Street.

[Latitude, 35° 41' N.; longitude, 108° 57' W. Elevation of barometer above sea-level, 7,026 feet. Elevation of exposed thermometer above ground, 24 feet. Elevation of rain-gauge above ground, 30 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only.)										Temperature.								Precipitation.			Wind.								
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.				Total amount.	Largest amount.	Any 3 consecutive 8-hourly measurements.	Miles.	Direction from—	Maximum hourly velocity during month.	Prevailing direction.	Total movement.					
	7 a. m.	3 p. m.	11 p. m.							7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.									Absolute range.	Mean maximum.	Mean minimum.		
1884.	In.	In.	In.	W.	W.	W.	W.	W.	W.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	W.	W.	W.	W.	Miles.	Direction from—	Maximum hourly velocity during month.	Prevailing direction.	Total movement.	
Jan.	23.153	23.128	23.163	23.163	23.506	1	92.800	27	.706	25.9	33.2	28.7	30.9	54.5	2	-2	31	54.5	41.6	21.4	1.77	.53	29, 30							4.497
Feb.																														
Mar.																														
Apr.																														
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Aug.																														
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Nov.																														
Dec.																														
Sums.																														
Means.																														

* Office re-established December 1, 1884.

Meteorological summary for the year ending December 31, 1884—Continued.

SAVANNAH, GA.

Location of office on December 31, 1884, corner Bay and Drayton streets.

Latitude, 32° 5' N.; longitude, 81° 5' W. Elevation of barometer above sea-level, 87 feet. Elevation of exposed thermometer above ground, 40 feet. Elevation of rain-gauge above ground, 56 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.							Precipitation.			Wind.								
	Washington time.					Monthly mean.					Washington time.			Self-registering thermometers.				Any 8 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.							
	7 p. m.	3 p. m.	11 p. m.	In.	Th.	Highest.	Lowest.	Date.	Range.	In.	Th.	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction.	Date.	Miles.
1884.																													
Jan.	30.145	30.097	30.152	30.131	30.532	27	29.630	8	1.002	41.6	52.6	45.5	46.6	68.5	18	7.8	26	W.	9 NW.	5,669									
Feb.	30.049	30.014	30.044	30.036	30.351	16	29.684	28	7.767	52.5	65.8	57.1	58.3	76.5	7	10.17	26	NW.	20 S.	5,285									
Mar.	30.008	29.964	30.004	29.992	30.374	16	29.636	28	7.788	56.6	68.0	60.6	61.7	88.5	25	4.91	1.71	23	3 S.	6,349									
Apr.	29.862	29.831	29.873	29.805	30.062	27	29.446	2	6.886	59.9	72.0	63.9	65.3	98.7	29	3.78	1.35	12	2 W.	5,554									
May	29.926	29.878	29.919	29.908	30.144	3	29.655	27	4.489	72.1	88.8	78.0	76.1	100.5	12	1.22	.61	27, 28	N.E.	5,436									
June	29.956	29.925	29.952	29.944	30.149	16	29.656	11	4.888	72.6	80.5	78.6	75.6	91.0	9	69.2	3.45	22, 23	N.E.	5,012									
July	29.901	29.856	29.895	29.884	30.075	23	29.728	16	8.522	70.8	87.8	80.1	82.4	91.0	6	68.5	8	27, 28	E.	4,701									
Aug.	29.967	29.921	29.963	29.950	30.123	19	29.742	30	3.853	75.4	84.2	78.6	78.7	92.5	4	69.0	12	25, 26	N.E.	4,325									
Sept.	30.008	29.969	30.002	29.993	30.188	26	29.710	10	4.718	72.2	82.1	74.9	76.4	88.2	18	60.5	15	27, 28	E.	4,832									
Oct.	30.071	30.017	30.050	30.046	30.349	20	29.827	9	5.522	65.1	77.7	68.8	70.6	92.0	7	44.5	24	47, 5	N.E.	4,078									
Nov.	30.061	29.995	30.035	30.030	30.307	7	29.490	26	6.117	52.3	66.8	58.9	58.7	75.7	4	37.0	25	38, 7	N.W.	4,826									
Dec.	30.107	30.047	30.088	30.081	30.406	27	29.696	6	7.110	49.5	60.8	52.8	54.4	75.5	11	27.5	20	48, 0	N.	4,521									
Sum.	360.001	359.514	363.977	359.800	369.869	27	29.446	92	7.287	749.1	881.1	794.0	804.8	908.8	94	408.8	898.5	715.6	50.47	.....	459,998								
Means.	30.004	29.960	29.994	29.989	30.532	27	29.446	92	0.16	62.4	73.4	65.3	67.0	96.0	94	18.5	76	38.1	74.9	59.6	.....	.....	.....	.....	.....	.....	.....	.....	.....

¹ One 11 p. m. observation missed.

² 27 days.

³ Three 11 p. m. observations missed.

⁴ Four 11 p. m. observations missed.

⁵ Two 7 a. m., three 3 p. m., and three 11 p. m. observations missed.

⁶ January.

⁷ April.

⁸ July.

REPORT OF THE CHIEF SIGNAL OFFICER.

469

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point.					Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				Clear.		Fair.	Cloudy.	On which, .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.44 a. m., 2.44 p. m., and 10.44 p. m., local time.

Correction for instrumental error of barometer used: From 6.44 a. m., January 1, to 10.44 p. m., December 31, 1884, inclusive, —.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.100; February, 0.090; March, 0.090; April, 0.090; May, 0.090; June, 0.090; July, 0.090; August, 0.090; September, 0.090; October, 0.090; November, 0.090; December, 0.100.

REMARKS.—Light frost April 10, last of spring; light frost October 25, first of season; heavy frost December 3, first of season.

S. C. EMERY,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884 - Continued.

SHAW, FORT, MONT.

Location of office on December 31, 1884, post quarters.

[Latitude, 47° 31' N.; longitude, 111° 48' W. Elevation of barometer above sea-level, 3,550 (B) feet. Elevation of exposed thermometer above ground, 7 feet. Elevation of rain-gauge above ground, 24 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.					Precipitation.		Wind.			Total movement.						
Washington time.				Washington time.				Self-registering thermometers.						Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.											
7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Highest.	Lowest.	Date.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.		Total amount.	Largest amount.	Date.	Miles.		Direction from—	Date.				
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	Miles.	Direction from—	In.					
Jan.	28.423	28.411	28.439	26.414	28.802	1.25	091	20	.808	19.6	25.8	20.4	21.9	51.0	12	15.0	4	68.0	20.1	11.5	.86	28	8	48	SW.	12 31	SW.	8,325		
Feb.	28.362	28.355	28.376	26.377	28.856	26.25	654	17	1.202	6.1	13.5	8.8	9.5	53.0	24	32.0	11	83.0	19.0	0.1	.82	28	19	40	SW.	1	SW.	6,032		
Mar.	28.284	28.271	28.277	26.277	28.751	20.25	892	10	.689	20.7	36.1	27.1	28.0	55.3	24	32.5	7	77.8	39.8	18.5	.47	12	6	34	SW.	8	SW.	5,472		
Apr.	28.380	28.352	28.369	26.364	28.718	18.25	931	13	.797	31.6	49.1	40.5	40.4	70.8	23	30.8	19	50.0	33.4	30.4	.59	22	7	31	SW.	25	SW.	5,801		
May	28.405	28.371	28.374	26.384	28.680	29.26	048	3	.640	41.6	63.7	53.4	52.0	81.0	8	26.8	4	54.2	67.9	39.6	.74	34	27	28	30	N.W.	9	11	W.	5,529
June	28.367	28.330	28.335	26.344	28.653	30.26	173	26	4.80	53.8	72.8	62.3	63.0	91.5	19	45.0	1	46.5	76.6	51.5	2.66	96	21	22	35	SW.	24	W.	5,598	
July	28.411	28.376	28.393	26.393	28.542	30.26	134	31	4.08	52.0	71.4	61.4	61.6	85.0	5	37.8	5	47.2	73.5	50.4	2.66	96	21	22	35	SW.	31	W.	5,008	
Aug.	28.459	28.432	28.439	26.441	28.655	2.52	197	30	4.58	52.0	76.8	63.6	64.0	92.0	10	36.5	20	55.5	78.4	49.3	.59	49	14	15	36	N.W.	1	W.	4,658	
Sept.	28.318	28.283	28.304	26.303	28.592	10.20	004	27	5.88	40.1	57.3	46.8	48.1	80.0	20	38.0	19	50.0	60.2	38.0	2.29	76	14	42	W.	27	W.	6,769		
Oct.	28.320	28.317	28.310	26.312	28.713	10.25	969	1	1.744	38.7	55.9	44.3	46.3	78.0	17	21.5	20	56.5	50.1	34.9	.39	25	2	46	W.	25	W.	8,789		
Nov.	28.448	28.414	28.427	26.430	28.656	15.28	153	24	5.03	32.3	47.6	37.3	39.1	67.0	7	—	5	22.3	70.5	53.5	27.0	84	16	47	SW.	3	SW.	7,065		
Dec.	28.350	28.344	28.352	26.349	28.627	9.25	912	20	9.15	—	1.0	7.9	2.9	62.2	1	44.5	24	106.7	11.1	—	6.1	46	6	40	SW.	8	W.	5,457		
Sum.	316.534	316.256	316.380	26.386	316.389	8.232	387.5	577.4	467.6	477.7	—	—	774.9	622.6	944.9	13.64	—	—	—	—	—	—	—	—	—	—	—	—	74,538	
Means.	28.378	28.355	28.365	26.366	28.656	126.25	654.17	—	.686	32.3	43.1	39.0	39.8	72.0	110	44.5	24	64.6	61.9	28.7	—	—	—	—	—	—	—	—	—	

• Mean of 24 days.

† February.

‡ August.

§ December.

SHAW, FORT, MONT.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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	North.		Northeast.		East.		Southeast.		South.		Southwest.		West.		Northwest.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.41 a. m., 12.41 p. m., and 8.41 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 3 p. m., August 19, inclusive, +.060 inch; from 7 a. m., August 30, to 11 p. m., December 31, 1884, inclusive, +.017 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.860; February, 3.860; March, 3.860; April, 3.870; May, 3.660; June, 3.870; July, 3.810; August, 3.690; September, 3.610; October, 3.700; November, 3.830; December, 3.890.

SAM'L W. MORRISON
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SHREVEPORT, LA.

Location of office on December 31, 1884, Randall Block, No. 22 Milam street.

[Latitude, 32° 30' N.; longitude, 93° 40' W. Elevation of barometer above sea-level, 227 feet. Elevation of exposed thermometer above ground, 33 feet. Elevation of rain-gauge above ground, 44 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.					Monthly mean.	Highest.	Lowest.	Range.	Washington time.					Self-registering thermometers.					Total amount.	Largest amount.	Any 3 consecutive 8-hourly measurements.	Miles.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.					Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Data.	Direction from—	Data.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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* January.

† April.

‡ July.

SHREVEPORT, LA.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—							River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.		Washington time.				Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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Percentages.

* May.

† September.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.54 a. m., 1.54 p. m., and 9.54 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., May 31, inclusive, +.025 inch; from 7 a. m., June 1, to 11 p. m., June 30, inclusive, —.005 inch; from 7 a. m., July 1, to 11 p. m., December 31, 1884, inclusive, +.021 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.260; February, 0.260; March, 0.250; April, 0.240; May, 0.240; June, 0.230; July, 0.230; August, 0.230; September, 0.240; October, 0.240; November, 0.250; December, 0.250.

REMARKS.—January 8, ice floating in the river; 9, lunar halo the 4th; flood, 24th to 29th, inclusive. March, thunder-storm, 22d; flood, 1st and 2d. April, violent thunder-storm 14th; rainbow 30th. May, violent thunder-storm 21st and 22d; flood, 11th to 17th, inclusive. August, sodical light 2d. First frost November 6; first killing frost, November 7; first ice, November 24.

W. S. DELANO,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SILL, FORT, IND. T.

Location of office on December 31, 1884, post quarters.

[Latitude, 34° 40' N.; longitude, 86° 30' W. Elevation of barometer above sea-level, 1,200 (B) feet. Elevation of exposed thermometer above ground, 6 feet. Elevation of rain-gauge above ground, 6 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.		Total movement.													
Washington time.			Monthly mean.			Highest.			Lowest.			Range.			Washington time.			Self-registering ther- mometers.				Mean maximum.			Mean minimum.			Any consecutive 8-hourly measure- ments.		Maximum hourly veloci- ty during month.		Prevailing direction.		
7 a. m.	3 p. m.	11 p. m.	In.	In.	In.	In.	In.	In.	In.	In.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute Range.	Mean maximum.		Mean minimum.	Total amount.	Large- st amount.	Date.	Miles.	Direction from—	Date.	Miles.	Direction				
1884.																																		
Jan.	28.710	28.663	28.665	28.679	28.839	21	28.457	29	28.373	75.0	98.1	82.2	85.1	107.0	29	66.0	10	42.0	100.1	71.7	23	.11	25	82	SW.	29	S.	7,618						
Feb.	28.801	28.738	28.749	28.763	28.985	4	28.566	19	28.419	69.3	90.5	76.2	78.7	102.0	9	58.0	5	44.0	98.0	64.8	1.21	.59	19	20	32	NE.	1	SE.	7,101					
Mar.	28.750	28.688	28.693	28.709	28.968	20	28.398	23	28.251	68.0	88.6	76.1	77.6	99.0	1.2	53.0	25	46.0	90.7	64.5	2.24	.53	23	36	S.	30	SE.	8,906						
Apr.	28.915	28.840	28.863	28.873	28.917	23	28.643	11	28.527	54.5	74.3	62.1	63.6	91.0	5.6	39.5	28	51.5	76.6	53.5	5.01	3.65	30	31	36	N.	8	S.	5,317					
May	28.913	28.857	28.868	28.886	28.939	6	28.835	22	28.674	40.1	57.8	43.8	46.8	74.5	3	25.0	23	49.5	60.8	39.0	2.61	.99	10	11	38	N.	27	S.	5,419					
June	28.837	28.769	28.820	28.809	28.826	31	28.222	4	1.104	25.9	34.9	30.1	31.0	66.0	3	2.0	25	64.0	41.1	32.5	2.71	1.97	19	10	43	N.	22	N.	7,008					
July																																		
Aug.																																		
Sept.																																		
Oct.																																		
Nov.																																		
Dec.																																		
Sums																																		
Means																																		

* Twenty-seven days.

BILL, FORT, IND. T.—Continued.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.34 a. m., 1.34 p. m., and 9.34 p. m., local time.

Corrections for instrumental error of barometer used: From 7 a. m., July 1, to 11 p. m., July 10, inclusive, .00 inch; from 7 a. m., July 15, to 11 p. m., December 31, 1894, inclusive, -.028 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: July, 1.20; August, 1.18; September, 1.22; October, 1.26; November, 1.31; December, 1.33. Office records burned June 14.

J. H. DAVIS,

Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SITKA, ALASKA.

Location of office on December 31, 1884, Castle Building, first floor.

[Latitude 57° N.; longitude, 135° 19' W. Elevation of barometer above sea-level, 68 feet. Elevation of exposed thermometer above ground, 13 feet. Elevation of rain-gauge above ground, 45 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Washington time.					Monthly mean.	Highest.			Lowest.			Range.	Washington time.				Self-registering thermometers.				Total amount.		Any consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Date.		Lowest.	Date.	Range.	7 a. m.		3 p. m.		11 p. m.		Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.			Total amount.	Date.		Miles.	Direction from—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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* February.

† December.

‡ June.

REPORT OF THE CHIEF SIGNAL OFFICER.

477

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calm.	Dew-point.								Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		7 a. m.			11 p. m.			Mean.	7 a. m.			11 p. m.			Mean.	Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 30°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
										7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.		7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.											7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. 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m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.07 a. m., 11.07 a. m., and 7.07 p. m., local time. Correction for instrumental error of barometer used: From 3.07 a. m., January 1, to 7.07 p. m., December 31, 1884, inclusive, +.003 inch. Barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.070; February, 0.070; March, 0.070; April, 0.070; May, 0.060; June, 0.060; July, 0.060; August, 0.060; September, 0.060; October, 0.070; November, 0.070; December, 0.070.

JOHN J. MOLRAN
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

SMITHVILLE, N. C.

Location of office on December 31, 1884, Central Building, Fort Johnston.

[Latitude, 33° 55' N.; longitude, 78° 1' W. Elevation of barometer above sea-level, 34 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 35 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.			
Washington time.				Monthly mean.						Washington time.				Self-registering thermometers.						Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.				
7 a. m.	3 p. m.	11 p. m.		In.	Iv.	Date.	Lowest.	Range.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Lat. Rec.	Date.	Miles.	Direction from—		Date.	Miles.	
1884.																												
Jan.....	30.169	30.125	30.172	30.155	30.679	27.29	4.28	1.251	39.8	47.3	42.4	43.2	63.5	24	6.0	6	57.5	51.3	34.5	3.44	84	8	49	SE.	8	8	W.	
Feb.....	30.084	30.058	30.095	30.075	30.500	16.29	4.90	1.010	51.5	59.3	53.7	51.8	69.0	29	43.5	4	47.6	42.3	48.0	2.88	80	17	41	SW.	19	8	SW.	
Mar.....	30.038	30.098	30.042	30.025	30.404	4.20	5.73	29.831	52.5	60.5	55.6	56.2	75.0	29	43.5	4	47.6	42.3	48.0	2.88	80	17	41	SW.	19	8	SW.	
Apr.....	29.904	29.851	29.894	29.880	30.184	12.29	3.30	2	86.4	55.5	64.8	58.0	69.4	25	38.5	10	47.1	42.3	48.0	2.88	80	21	32	SE.	15	9	NW.	
May.....	29.969	29.940	29.965	29.936	30.223	3.29	7.11	1	512	68.0	76.0	60.0	71.5	25	52.6	8	33.4	30.6	64.4	2.31	70	27	37	W.	9	9	SW.	
June.....	30.035	30.009	30.055	30.023	30.258	16.39	7.56	11	502	71.0	78.9	72.4	74.1	26	50.6	8	33.4	30.6	64.4	2.31	70	27	37	W.	9	9	SW.	
July.....	29.929	29.885	29.922	29.915	30.123	23.23	7.41	10	882	78.2	84.2	72.4	74.1	26	50.6	8	33.4	30.6	64.4	2.31	70	27	37	W.	9	9	SW.	
Aug.....	30.005	29.988	30.014	30.002	30.190	20.26	7.73	16	407	73.9	81.1	78.3	77.1	26	50.6	8	33.4	30.6	64.4	2.31	70	27	37	W.	9	9	SW.	
Sept.....	30.094	30.070	30.101	30.088	30.251	26.39	8.40	17	411	72.4	79.7	76.0	68.0	5	36.9	15	26.1	31.2	68.9	1.03	78	20	26	SW.	20	8	NE.	
Oct.....	30.140	30.099	30.128	30.124	30.403	20.29	8.73	30	620	64.2	73.2	66.0	68.0	6	36.9	24	38.9	34.9	70.7	2.31	21	30	24	NE.	12	3	SE.	
Nov.....	30.102	30.054	30.080	30.082	30.380	6.72	5.33	28	827	50.1	62.1	54.2	55.5	4	32.9	25	38.9	33.8	45.7	2.31	21	30	24	NE.	27	2	E.	
Dec.....	30.176	30.125	30.163	30.155	30.498	27.29	7.71	18	727	45.7	53.9	48.4	49.3	69.9	8	15.9	20	54.0	50.1	40.1	2.93	97	14	15	SW.	29	29	N.
Sum.....	360.651	290.210	360.619	360.489	8,244	729.4	821.1	765.3	475.3	845.4	974.3	336.00	88,769
Means.....	30.054	30.018	30.051	30.011	30.679	27.29	8.20	72	695	68.4	68.4	62.6	63.8	88.8	8	14	6	30.6	70.4	50.2	SW.

July.

April.

January.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.56 a. m., 2.56 p. m., and 10.56 p. m., local time. Corrections for instrumental error of barometer used: From 6.56 a. m., January 1, to 10.56 p. m., August 31, inclusive, +.022 inch. From 6.56 a. m., September 1, to 10.56 p. m., December 31, 1894, +.013.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.040; February, 0.040; March, 0.040; April, 0.040; May, 0.040; June, 0.040; July, 0.030; August, 0.040; September, 0.040; October, 0.040; November, 0.040; December, 0.040.

F. P. CHAFFEE,
Sergeant, Signal Corps, U. S. A.

[illegible]

Meteorological summary for the year ending December 31, 1884—Continued.

SPOKANE FALLS, WASH.

Location of office on December 31, 1884, Brown's Block.

[Latitude, 47° 29' N.; longitude, 117° 24' W. Elevation of barometer above sea-level, 1,009 feet. Elevation of exposed thermometer above ground, 24 feet. Elevation of rain-gauge above ground, 40 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.							Precipitation.			Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Washington time.			Monthly mean.			Range.	Date.	Lowest.	Highest.	Washington time.			Self-registering thermometer.			Any 3 consecutive hourly measurements.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	7 p. m.	3 p. m.	11 p. m.	7 a. m.	3 p. m.	11 p. m.					Monthly mean.	Maximum.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Least amount.	Date.		Miles.	Direction from—		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
1884.	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .	I _b .	I _c .	I _a .

'Three 7 a. m., five 3 p. m., and five 11 p. m. observations missed.

'For 23 days.

'For 364 days.

'January.

'February.

'August.

'December.

SPOKANE FALLS, WASH.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—							Number of calms.	Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).	Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	North.	Northeast.	Southeast.	South.	Southwest.	West.	Northwest.					Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 32°.	Thunder-storms.	Auroras.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
												Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.										7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
1884.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

* For 359 days.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.19 a. m., 12.19 p. m., and 8.19 p. m., local time. Corrections for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., November 28, inclusive, + .005 inch; from 11 p. m., November 30 to 11 p. m., December 31, 1884, inclusive, + .009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 2.14; February, 2.13; March, 2.13; April, 2.06; May, 2.05; June, 2.04; July, 1.98; August, 2.00; September, 2.01; October, 2.03; November, 2.08; December, 2.13.

REMARKS.—Office moved November 30. First observation in new office 11 p. m., November 30. Old office destroyed by fire November 29. Elevation of instruments from January 1 to November 28, inclusive, as follows: Barometer above mean tide-level, 1,906 feet; thermometer above ground, 22.08 feet; rain-gauge above ground, 32.48 feet. Station barometer No. 135 broken by fire November 29 and No. 1857 adopted as station barometer. Unusually heavy snow-storms from December 17 to December 23, impeding travel on railroads. No trains between here and Portland, Oreg., during that time.

D. MOORE,
Sergeant, Signal Corps, U. S. A.

Metorological summary for the year ending December 31, 1884—Continued.

SPRINGFIELD, ILL.

Location of office on December 31, 1884, corner Sixth and Monroe streets.

[Latitude, 39° 49' N.; longitude, 89° 39' W. Elevation of barometer above sea-level, 644 feet. Elevation of exposed thermometer above ground, 39 feet. Elevation of rain-gauge above ground, 61 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.				Precipitation.		Wind.											
Month.	Washington time.			Monthly mean.			Washington time.			Self-registering ther- mometers.			Total amount.	Mean minimum.	Any 3 con- secutive 8-hourly measure- ments.		Maximum hourly velocity during month.		Prevailing direction.	Total movement.							
	7 p. m.	3 p. m.	11 p. m.	Highest.	Lowest.	Date.	Range.	11 p. m.	3 p. m.	7 a. m.	Monthly mean.	Maximum.			Date.	Minimum.	Date.	Absolute range.			Mean maximum.	Largest amount.	Date.	Direction from—	Miles.		
1884.																											
Jan.	29.511	29.495	29.521	29.500	30.005	5.29	102	1.003	18.2	24.3	20.0	20.8	62.5	30	—	22.3	5.84	29.6	12.8	1.51	62.6	18.19	29	W.	90	S.	7,078
Feb.	29.359	29.327	29.355	29.317	29.765	15.23	701	1.974	23.6	35.2	31.4	32.1	55.1	2	2	5.64	39.5	41.2	24.4	4.24	1.14	12.84	19	NW.	19	S.	7,504
Mar.	29.327	29.301	29.328	29.319	29.721	4.23	716	1.005	35.2	45.0	39.8	40.0	66.5	27	7.0	3.59	55.5	48.0	32.4	3.70	.99	29.83	3	W.	28	S.	7,806
Apr.	29.277	29.256	29.267	29.267	29.528	20.23	720	1.808	47.2	57.0	51.2	51.8	80.0	30	32.2	8.47	8.47	59.8	44.0	2.49	.81	19.20	82	S. W.	14, 27	NW.	7,806
May	29.301	29.281	29.291	29.291	29.632	29.23	934	1.008	54.8	69.1	60.7	62.2	78.1	21	41.0	29.37	71.0	62.7	3.79	1.07	5.6	24	NW.	5, 19	S.	5, 415	
June	29.335	29.316	29.334	29.335	29.548	29.23	983	9.563	64.3	77.8	69.7	71.3	90.8	22	50.9	10.39	80.1	66.8	3.20	.80	12.9	29	NW.	8	S.	4, 248	
July	29.277	29.257	29.264	29.296	29.504	20.20	959	4.445	60.6	80.4	71.0	74.3	90.8	22	61.2	7.23	83.1	62.7	1.62	.84	24.25	30	NW.	26	S.	4, 340	
Aug.	29.400	29.368	29.377	29.389	29.668	9.23	978	2.800	65.4	79.5	70.2	71.7	91.1	18	20	48.9	42.2	81.6	63.7	1.54	1.16	27.28	29	NW.	8	S.	5, 032
Sept.	29.392	29.350	29.359	29.367	29.634	13.23	970	2.684	64.2	78.8	69.5	70.9	91.1	9	50.9	21.40	80.7	62.8	1.68	.88	26.27	29	W.	28	S.	5, 097	
Oct.	29.501	29.472	29.499	29.479	29.799	18.23	1188	7.611	53.9	67.1	58.1	59.7	86.0	2	34.9	23.51	69.8	51.1	2.74	.93	31	20	NW.	5, 23	S.	5, 097	
Nov.	29.443	29.412	29.430	29.429	29.890	6.23	856	2.004	39.9	49.8	42.8	44.2	68.9	9	13.6	24.53	53.6	36.2	1.80	.51	22.23	86	NW.	23	NW.	5, 374	
Dec.	29.474	29.430	29.445	29.444	29.967	19.23	684	6.123	27.4	31.6	24.8	28.1	60.0	5	—	8.19	68.8	34.9	2.41	1.50	27.28	82	W.	31	S.	7, 006	
Sums	302,509	352,216	352,440	352,436	402,573	7,693	6,014	7,623	0	110	22.3	50.3	61.3	44.3	110	403.8	735.3	3,632.0	43.18	..	..	..	..	..	..	..	72,148
Means	29.383	29.354	29.370	29.369	30.005	5.23	684	7.6	47.8	58.0	51.2	52.3	91.1	110	22.3	50.3	61.3	44.3	..	..	..	..	..	..	..	..	..

* January.

† December.

‡ August.

§ September.

SPRINGFIELD, ILL.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Dew-point.				Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																	
	Number of calms.								7 a. m.		3 p. m.		11 p. m.		Mean.		7 a. m.		3 p. m.		11 p. m.		Mean.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.	
									North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.																		
1864.																																		
Jan.	14	7	1	3	22	13	15	15	3	13.6	12.1	14.1	13.3	81.7	60.3	77.1	72.0	4.7	4.9	4.4	4.7	72.0	68.3	75.1	73.0	11	14	16	27	0	0	0	0	0
Feb.	16	11	6	17	6	13	15	20	3	24.7	24.4	23.4	24.8	81.3	63.6	78.3	75.1	4.7	7.2	6.6	6.4	78.3	75.1	73.0	73.0	11	14	13	21	0	0	0	0	0
Mar.	11	10	10	13	16	5	13	15	1	38.0	31.5	30.8	30.8	78.8	61.0	72.4	70.7	4.4	9.2	4.3	4.3	70.7	62.9	67.5	62.9	10	10	11	14	0	0	0	0	0
Apr.	9	13	8	13	15	1	16	14	0	38.0	36.5	40.3	38.3	71.5	49.7	67.5	62.9	6.5	9.3	6.2	6.3	67.5	62.9	67.5	62.9	7	11	12	14	0	0	0	0	0
May	14	9	6	17	13	15	9	4	48.5	49.1	50.2	49.3	74.9	51.4	68.7	63.0	4.7	5.6	3.3	4.5	68.7	63.0	63.0	63.0	12	12	13	12	0	0	0	0	0	
June	5	10	14	15	18	11	11	4	12	60.6	63.2	62.9	62.2	82.1	62.9	67.7	74.9	6.4	7.1	6.3	6.3	74.9	67.7	63.0	63.0	5	12	12	12	0	0	0	0	0
July	13	7	4	16	9	10	12	17	6	62.1	62.8	63.6	62.8	70.7	57.5	73.2	66.1	5.1	6.3	3.7	5.0	73.2	66.1	66.1	66.1	7	19	5	18	0	0	0	0	0
Aug.	11	10	8	19	10	10	12	3	53.4	57.3	56.9	56.9	78.5	49.1	70.7	69.1	3.0	5.6	3.3	3.0	70.7	69.1	69.1	69.1	6	13	17	1	0	0	0	0	0	
Sept.	6	4	7	6	38	15	5	9	53.9	59.0	59.9	59.0	81.2	52.7	62.7	72.5	68.3	4.3	4.3	3.6	4.1	62.7	68.3	68.3	68.3	4	14	5	0	0	0	0	0	0
Oct.	6	7	3	7	31	17	7	14	1	47.4	50.0	48.4	48.4	78.8	56.1	70.0	68.3	3.3	4.5	3.2	3.7	70.0	68.3	68.3	68.3	8	14	4	0	0	0	0	0	0
Nov.	11	8	2	2	17	17	5	25	3	82.2	35.8	33.9	34.0	74.2	60.4	72.2	68.9	4.4	5.1	4.0	4.5	72.2	68.9	68.9	68.9	13	9	7	18	0	0	0	0	0
Dec.	12	8	2	2	4	10	18	5	21.3	23.4	22.6	22.4	77.5	72.3	72.3	79.3	76.4	7.2	8.2	6.9	7.4	72.3	79.3	76.4	76.4	5	7	15	11	0	0	0	0	0
Sums	118	106	72	106	241	122	115	178	37	494.3	505.1	512.7	504.0	937.2	693.0	881.6	838.2	60.4	71.0	53.9	61.8	838.2	881.6	838.2	838.2	112	150	104	142	38	89	8	33	0
Means	10.7	9.7	6.6	9.7	2.2	1.1	1.0	5.6	3.4	41.2	42.1	42.7	42.0	78.1	58.2	73.5	69.9	5.3	5.9	4.5	5.2	73.5	69.9	73.5	73.5	30.6	41.0	28.4	38.8	10.4	24.3	2.2	29.0	0.0
Percentages.																																		

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.10 a. m., 2.10 p. m., and 10.10 p. m., local time.

Corrections for instrumental error of barometer used: From 6.10 a. m., January 1, to 10.10 p. m., August 31, inclusive, +.013 inch; from 6.10 a. m., September 1, to 10.10 p. m., December 31, 1884, inclusive, +.008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.730; February, 0.730; March, 0.720;

REMARKS — Barometer No 440 instrumental error = .008 unadjusted for No 398 instrumental error = .013 at 6.10 a. m. (local time) September 1. January 5 4.4 m.

KEMAEKA.—Barometer No. 440, instrumental error = .008, substituted for No. 306, instrumental error = .013, at 6.10 a. m. (local time), September 1, January 6, temperature = 22.3, coldest since opening of station. Last snow, April 22; first light frost, October 19; first killing frost, October 23; first snow, November 17.

WILLIAM NORRINGTON,

Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

STOCKTON, FORT, TEX.

Location of office on December 31, 1884, south corner of Plaza, half a mile from Fort Stockton.

[Latitude, 30° 53' N.; longitude, 102° 53' W. Elevation of barometer above sea-level, 3,010 (B) feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.						Precipitation.		Wind.		
Month.	Washington time.				Monthly mean.				Washington time.				Self-registering thermometers.				Total amount.	Any 8 consecutive 8-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.	Total movement.	
	7 p. m.	3 p. m.	11 p. m.	Range.	Date.	Lowest.	Highest.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Direction from—			Miles.	Date.				
1884.																								
Jan.	27.149	27.117	27.140	27.134	27.505	27.505	27.140	27.505	27.505	27.134	27.505	27.134	27.505	27.134	27.505	27.134	27.505	27.134	27.505	27.134	27.505	27.134	27.505	27.134
Feb.	27.191	27.165	27.189	27.183	27.502	27.502	27.191	27.502	27.502	27.183	27.502	27.183	27.502	27.183	27.502	27.183	27.502	27.183	27.502	27.183	27.502	27.183	27.502	27.183
Mar.	27.235	27.206	27.228	27.223	27.517	27.517	27.235	27.517	27.517	27.223	27.517	27.223	27.517	27.223	27.517	27.223	27.517	27.223	27.517	27.223	27.517	27.223	27.517	27.223
Apr.	27.234	27.214	27.233	27.229	27.517	27.517	27.234	27.517	27.517	27.229	27.517	27.229	27.517	27.229	27.517	27.229	27.517	27.229	27.517	27.229	27.517	27.229	27.517	27.229
May	27.244	27.224	27.243	27.238	27.529	27.529	27.244	27.529	27.529	27.238	27.529	27.238	27.529	27.238	27.529	27.238	27.529	27.238	27.529	27.238	27.529	27.238	27.529	27.238
June	27.276	27.255	27.275	27.270	27.538	27.538	27.276	27.538	27.538	27.270	27.538	27.270	27.538	27.270	27.538	27.270	27.538	27.270	27.538	27.270	27.538	27.270	27.538	27.270
July	27.285	27.265	27.284	27.279	27.548	27.548	27.285	27.548	27.548	27.279	27.548	27.279	27.548	27.279	27.548	27.279	27.548	27.279	27.548	27.279	27.548	27.279	27.548	27.279
Aug.	27.278	27.258	27.277	27.272	27.558	27.558	27.278	27.558	27.558	27.272	27.558	27.272	27.558	27.272	27.558	27.272	27.558	27.272	27.558	27.272	27.558	27.272	27.558	27.272
Sept.	27.276	27.256	27.275	27.270	27.568	27.568	27.276	27.568	27.568	27.270	27.568	27.270	27.568	27.270	27.568	27.270	27.568	27.270	27.568	27.270	27.568	27.270	27.568	27.270
Oct.	27.276	27.256	27.275	27.270	27.578	27.578	27.276	27.578	27.578	27.270	27.578	27.270	27.578	27.270	27.578	27.270	27.578	27.270	27.578	27.270	27.578	27.270	27.578	27.270
Nov.	27.276	27.256	27.275	27.270	27.588	27.588	27.276	27.588	27.588	27.270	27.588	27.270	27.588	27.270	27.588	27.270	27.588	27.270	27.588	27.270	27.588	27.270	27.588	27.270
Dec.	27.276	27.256	27.275	27.270	27.598	27.598	27.276	27.598	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270
Sums	27.276	27.256	27.275	27.270	27.598	27.598	27.276	27.598	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270
Means	27.276	27.256	27.275	27.270	27.598	27.598	27.276	27.598	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270	27.598	27.270

• January.

† December.

‡ July.

§ January.

STOCKTON, FORT, TEX.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Number of calms.	Dew-point.							Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.		Northwest.	Washington time.				Clondness (in tenths).					Percentages.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
										Mean.				Mean.					Mean.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storm.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.17 a. m., 1.17 p. m., and 9.17 p. m., local time.

Correction for instrumental error of barometer used: From 5.17 a. m., January 1, to 9.17 p. m., December 31, 1884, inclusive, — .023 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 3.140; February, 3.130; March, 3.080; April, 3.030; May, 3.010; June, 2.920; July, 2.940; August, 2.940; September, 2.960; October, 3.030; November, 3.120; December, 3.140.

REMARKS.—July 1, 1884, elevation of rain-gauge changed from 5 inches to 12 inches above ground.

JNO. W. BYRAM,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

TATOOSH ISLAND, WASH.

Location of office on December 31, 1884, on island.

[Latitude, 49° 28' N.; longitude, 124° 44' W. Elevation of barometer above sea-level, 86 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 1 foot.]

Barometer readings* (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.		Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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7 p. m.	3 p. m.	11 p. m.	In.	W.	Lowest.	Date.	In.	W.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	In.	W.	Amount.	Date.		Miles.		Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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* Wind data for December for 27½ days.

† For 56½ days.

‡ February.

§ December.

|| August.

TATOOSH ISLAND, WASH.—Continued.

[illegible]

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 3.49 a. m., 11.49 a. m., and 7.49 p. m., local time.

NOTES.—7 a. m., 9 p. m., and 11 p. m., Washington time, correspond to 5 a. m., 7 a. m., and 1 p. m., local time.
Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.009 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.100; February, 0.100; March, 0.100; April,

May, 0.090; June, 0.090; July, 0.090; August, 0.090; September, 0.090; October, 0.090; November, 0.100; December, 0.100.

R. L. SEBASTIAN,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

THOMAS, FORT, ARIZ.

Location of office on December 31, 1884, post quarters.

[Latitude, 33° 4' N.; longitude, 110° 2' W. Elevation of barometer above sea-level, 2,710 (B) feet. Elevation of exposed thermometer above ground, 3 feet. Elevation of rain-gauge above ground, 2 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.*				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Washington time.			Monthly mean.			Washington time.				Self-registering ther- mometers.						Any 3 con- secutive 8-hourly measure- ments.		Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	7 a. m.	3 p. m.	11 p. m.	In.	Highest.	Lowest.	Date.	Range.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.		Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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1884.	In.	In.	In.	In.	In.	In.	In.	In.	°	°	°	°	°	°	°	°	In.	In.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°

* No anemometer used.

† January.

‡ February.

§ July.

THOMAS, FORT, ARIZ.—Continued

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of time observed blowing from—								Dew-point.			Relative humidity (per cent.).			Cloudiness (in tenths).					Number of days—												
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.				Washington time.					Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.						
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.										3 p. m.	11 p. m.	Mean.			
1884.																																
Jan.....	0	0	0	0	12	18	3	4	37	23.5	29.3	30.0	27.6	76.6	47.0	65.1	62.9	4.0	4.4	2.3	2.6	13	15	3	3	0	23	0	0	0	0	
Feb.....	1	1	0	2	4	11	4	6	34	31.1	39.7	39.9	36.9	79.2	56.9	72.3	69.5	4.2	5.5	4.5	4.7	13	11	10	8	0	8	0	0	0	0	
Mar.....	3	1	1	2	5	7	4	6	33	33.7	38.3	41.3	37.8	75.6	47.3	65.6	62.8	4.5	4.2	3.8	4.5	12	12	11	8	0	4	0	0	1	0	
Apr.....	0	1	1	1	5	7	2	7	36	30.9	33.4	38.1	34.1	65.2	20.6	48.7	47.8	2.5	4.2	2.2	3.0	14	13	3	4	0	1	0	0	0	0	
May.....	4	1	1	3	7	7	3	5	31	40.9	36.9	44.4	40.7	67.2	24.3	45.9	45.8	2.2	3.1	2.2	2.6	20	20	10	6	0	0	0	0	0	0	
June.....	2	2	0	2	6	6	2	3	39	45.6	34.5	44.0	41.4	60.2	15.9	32.8	36.3	2.3	2.8	2.2	2.6	18	19	3	3	0	0	0	0	0	0	
July.....	2	0	0	2	9	8	2	3	56	52.1	49.6	52.7	51.4	51.4	19.0	32.8	34.4	2.3	2.1	2.6	2.8	23	16	4	4	0	0	24	1	0	0	
Aug.....	0	2	0	0	8	6	10	6	44	52.2	52.5	54.6	56.3	56.3	30.8	48.6	45.2	3.8	3.1	4.6	3.8	10	17	4	8	0	0	0	21	0	0	
Sept.....	1	0	4	2	23	15	16	8	28	48.7	52.1	56.8	52.5	59.0	34.4	68.9	54.1	3.6	3.6	2.3	3.2	18	9	2	3	0	0	13	2	0	0	
Oct.....	1	0	6	26	27	7	6	14	43	43.2	52.7	51.1	49.0	63.7	49.9	63.4	59.7	4.0	4.2	2.0	3.4	14	15	4	4	0	0	0	0	0	0	
Nov.....	1	2	6	19	22	17	14	8	28	28.2	43.8	40.3	39.1	66.7	53.4	70.1	64.1	2.1	2.3	2.4	2.3	23	4	2	3	0	0	0	0	0	0	
Dec.....	0	0	6	25	26	13	16	7	0	24.9	40.3	33.2	32.8	74.3	67.1	75.0	72.1	5.0	4.3	3.5	4.3	15	9	7	10	0	17	0	0	0	0	
Sums ..	15	9	20	105	157	96	244	68	354	45.5	508.1	530.8	498.0	807.4	477.6	679.2	654.7	40.5	44.8	36.4	40.4	196	127	49	72	0	63	101	7	0	0	
Means	1.4	.8	4.6	9.6	14.3	8.7	22.2	6.2	32.2	37.9	42.3	44.2	41.5	67.3	39.8	58.6	54.6	3.4	3.7	3.0	3.4	31.9	34.7	13.4	19.7	0	17.2	61.9	0	0	0	0
	Percentages.																								Percentages.							

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 4.48 a. m., 12.48 p. m., and 8.48 p. m., local time.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.014 inch.

The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 2.830; February, 2.830; March, 2.780; April, 2.730; May, 2.670; June, 2.630; July, 2.590; August, 2.60; September, 2.640; October, 2.710; November, 2.840; December, 2.820.

G. A. MARTIN
Priests, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

TOLEDO, OHIO.

Location of office on December 31, 1884, Room 41, Finlay Block, corner Madison and Summit streets.

[Latitude, 41° 40' N.; longitude, 83° 04' W. Elevation of barometer above sea-level, 651 feet. Elevation of exposed thermometer above ground, 65 feet. Elevation of rain-gauge above ground, 106 feet.]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.			Wind.						
Washington time.					Monthly mean.					Washington time.					Self-registering ther- mometers.					Any 3-con- secutive 8-hourly meas- ure- ments.		Maximum hourly velocity during month.		Prevailing direction.	Total movement				
7 p. m.	3 p. m.	11 p. m.			Monthly mean.	7 p. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.							
1884.																													
Jan.....	29.405	29.375	29.414	29.396	29.906	29.741	2	1.25	16.6	24.4	19.1	20.053.8	30	—14.0	6	67.8	28.4	11.7	2.61	68	SW.	30	39	SW.	3	W. S. E.	6,232		
Feb.....	29.323	29.304	29.301	29.309	29.817	29.583	19	1.24	27.5	32.7	29.5	29.959.3	19	—0.5	29	59.8	38.0	23.9	3.03	94	W. N. W.	4.5	33	W.	5,21	W. S. E.	5,620		
Mar.....	29.311	29.297	29.307	29.305	29.712	29.691	26	1.01	31.0	39.8	35.8	35.263.5	23	3.0	2	60.5	42.9	28.2	2.09	57	W.	25	38	W.	12	N. E.	5,620		
Apr.....	29.230	29.199	29.218	29.216	29.631	29.500	15	1.34	41.2	50.5	45.4	45.770.6	27	29.0	6	41.6	53.4	38.3	1.57	69	N. E.	25	44	SW.	22	N. E.	7,182		
May.....	29.246	29.205	29.229	29.229	29.611	29.537	19	7.94	55.8	65.8	57.9	59.892.0	23	36.5	29	45.5	68.7	61.0	4.71	72	SW.	9	32	SW.	26	N. E.	5,494		
June.....	29.270	29.232	29.239	29.239	29.652	29.595	9	7.01	67.9	75.6	68.5	70.791.5	23	52.5	10	39.0	78.6	62.2	2.70	234	SW.	9	40	SW.	26	N. E.	1,890		
July.....	29.220	29.184	29.200	29.201	29.451	29.396	5	4.89	67.3	77.6	69.9	71.039.0	1	54.0	14	35.0	79.4	63.1	3.66	201	SW.	30	30	SW.	3,25	N. E.	4,044		
Aug.....	29.351	29.310	29.329	29.330	29.618	29.565	29	6.53	64.5	75.7	68.7	69.391.5	17	47.5	9	44.9	78.7	61.5	1.48	130	S. W.	30	34	S.	24	S.	4,751		
Sept.....	29.372	29.321	29.350	29.348	29.736	29.698	28	7.08	61.8	62.1	55.5	56.885.0	9	47.7	21	43.8	78.0	61.5	1.02	39	S. W.	3,25	34	S.	24	S.	4,751		
Oct.....	29.443	29.401	29.416	29.420	29.825	29.757	6	7.08	51.3	62.1	55.5	56.885.0	4	30.2	30	64.8	64.9	47.4	2.14	52	N. W.	8	38	S.	24	S.	6,014		
Nov. ¹	29.372	29.331	29.364	29.362	29.729	29.631	23	1.048	85.9	45.1	39.0	40.062.5	1	15.2	24	47.3	48.5	31.9	1.39	94	SW.	3,4	40	SW.	23	S. W.	9,165		
Dec.....	29.369	29.339	29.409	29.397	29.913	29.803	6	1.810	37.6	32.7	29.8	30.050.0	4	—8.5	10	67.5	36.1	22.7	2.03	43	SW.	27,28	37	SW.	7	SW.	9,450		
Sums ..	352.042	351.642	351.902	351.862	11.135	530.2	658.2	2367.1	569.5						607.1	605.6	503.5	528.43										53,110	
Means ..	29.337	29.303	29.329	29.322	29.906	29.500	415	.028	45.6	54.8	48.9	49.891.5	17	—14.0	20	50.6	58.0	42.0										SW.	

1 One 8 p. m. observation missing.

2 One 11 p. m. observation missing.

3 January.

4 April.

5 June.

6 August.

7 September.

¹ One 8 p. m. observation missed.

² One 11 p. m. observation missed.

³ January.

⁴ April.

⁵ June.

⁶ August.

⁷ September.

TOLEDO, OHIO—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Aurora.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.34 a. m., 2.34 p. m., and 10.34 p. m., local time.
 Correction for instrumental error of barometer used: From 0.34 a. m., January 1, to 10.34 p. m., November 8, inclusive, —.012 inch; from 6.34 a. m., November 9, to 10.34 p. m., December 31, 1884, inclusive, +.015 inch.
 The barometric observations may be reduced to sea level by adding the following constants for the various months: January, 0.740; February, 0.740; March, 0.730; April, 0.710; May, 0.680; June, 0.680; July, 0.670; August, 0.670; September, 0.680; October, 0.700; November, 0.730; December, 0.740.

REMARKS.—January the coldest since 1873.

ALLEN BUELL,
 Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

TOTTEN, FORT, DAK.

Location of office on December 31, 1884, The Palmer House.

[Latitude, 47° 57' N.; longitude, 98° 57' W. Elevation of barometer above sea-level, 1,490 feet. Elevation of exposed thermometer above ground, 16 feet. Elevation of rain-gauge above ground, 5 feet]

Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.										
Month.	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Miles.									
	7 p. m.	3 p. m.	11 p. m.							Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.			Mean minimum.	Amount.			Date.	Miles.	Direction from—						
1884.																														
Jan.	28.323	28.317	28.313	28.316	28.486	9	28.074	10	.412	65.1	77.5	67.0	60.9	93.5	23	40.0	9	47.5	83.5	58.0	2.38	.77	13	48	W.	28	S.	7,828		
Feb.	28.327	28.310	28.310	28.319	28.548	19	28.004	22	.434	57.3	71.6	59.9	62.9	86.8	31	42.7	5	44.1	76.1	52.0	3.05	.89	23	24	38	NW.	4,8	NW.	7,974	
Mar.	28.338	28.331	28.331	28.333	28.649	4	27.944	1	.705	57.0	74.8	61.9	64.6	94.5	27	43.6	23	50.9	77.8	53.0	2.72	1.38	15	16	44	SW.	15	S.	9,828	
Apr.	28.270	28.284	28.284	28.269	28.308	28.643	27.804	2	.639	48.0	63.9	52.8	54.2	87.5	5	34.0	30	53.5	67.2	44.0	1.32	.69	22	23	51	W.	3	W.	8,445	
May	28.360	28.322	28.322	28.341	28.718	28.718	27.898	5	.832	85.6	51.2	41.1	42.6	85.8	18	12.0	31	73.8	55.9	32.2	.92	.55	4.5	44	NW.	6	NW.	11,696		
June	28.439	28.428	28.441	28.444	28.437	28.437	27.928	20	.909	20.0	81.2	22.7	24.6	62.0	12	22.2	23	84.2	34.5	13.8	.25	.08	20	21	44	NW.	19	NW.	7,670	
July	28.438	28.441	28.461	28.447	28.871	24	27.876	8	.965	—	1	0.0	2	43.0	2	33.0	31	78.0	0.3	7.4	.48	.16	28	29	38	NW.	20	NW.	9,157	
Aug.																														
Sept.																														
Oct.																														
Nov.																														
Dec.																														
Sum.																														
Means.																														

* For 23 days only.

† For 26 days only.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—										Dew-point.	Relative humidity (per cent.).	Cloudiness (in tenths).					Number of days—								
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.					Clear.	Fair.	Cloudy.	On which more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Auroras.			
										7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.										3 p. m.	11 p. m.	Mean.
1884.																										
Jan.	2	5	4	17	26	4	4	4	0	60.5	62.5	59.2	60.7	85.5	61.5	77.2	77.7	4.8	8	9	5	11	0	0	4	7
Feb.	9	9	7	18	9	13	6	22	0	52.8	56.0	54.2	54.3	85.2	59.1	81.9	75.4	2.7	7	19	5	12	0	0	0	9
Mar.	11	5	3	19	20	16	5	14	0	52.7	56.7	55.5	55.0	86.0	55.9	80.2	74.0	2.8	13	15	3	13	0	0	5	6
Apr.	6	1	8	13	11	13	15	11	0	42.0	46.0	46.6	44.9	86.7	54.0	80.1	73.6	5.0	3	4	16	6	10	0	0	1
May	11	1	2	20	19	8	7	24	1	30.9	33.8	34.1	32.9	83.1	55.1	77.5	71.9	4.4	11	14	6	10	0	14	0	1
June	9	3	9	7	7	17	8	27	3	17.1	24.4	19.0	20.2	87.8	77.1	85.9	83.6	3.2	12	13	5	19	14	27	0	0
July	6	2	2	7	5	11	13	46	1	5.2	0.6	4.7	3.5	78.3	74.6	79.4	77.4	3.6	10	13	8	12	24	31	0	3
Aug.																										
Sept.																										
Oct.																										
Nov.																										
Dec.																										
Sums																										
Means.																										

Percentages.

Percentages.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.32 a. m., 1.32 p. m., and 9.32 p. m., local time.

Correction for instrumental error of barometer used: From 5.32 a. m., June 9, to 9.32 p. m., December 31, 1884, inclusive, + 0.004 inch.

REMARKS.—Began taking meteorological observations at 5.32 a. m., June 9th. No observations taken on September 14, 15, 16, and 17. First frost September 24; killing frost September 30. First snow of the season, October 21. Navigation closed November 12.

E. J. GLASS,
First Lieut., Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

VICKSBURG, MISS.

Location of office on December 31, 1884, Danu's building, corner of Washington and Crawford streets.

[Latitude, 32° 22' N.; longitude, 90° 53' W. Elevation of barometer above sea-level, 244 feet. Elevation of exposed thermometer above ground, 32 feet. Elevation of rain-gauge above ground, 53 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.					Self-registering thermometers.					Washington time.						Self-registering thermometers.						Any consecutive 8-hourly measurements.				Maximum hourly velocity during month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Monthly mean.					Range.					Monthly mean.						Range.						Total amount.						Last 6 days.						Direction from—				Date.				Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	7 p. m.	3 p. m.	11 p. m.	In.	Th.	Highest.	Date.	Lowest.	In.	Th.	7 a. m.	3 p. m.	11 p. m.	Monthly mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Total amount.	Last 6 days.	In.	Th.	Miles.	Direction from—	Date.	Miles.	Direction from—	Date.	Prevailing direction.	Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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July.

April.

January.

VICKSBURG, MISS.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m., Washington time: Number of times observed blowing from—										Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—							River.																																
	North. Northeast. East. Southeast. South. Southwest. West. Northwest. Number of calms.										7 a. m.		8 p. m.		11 p. m.		Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which no precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-storms.	Highest.	Date.	Lowest.	Date.	Range.	Mean.																					
	Washington time.																																																							
1884.																																																								
Jan....	17	3	9	24	15	10	2	13	4	44.4	45.3	43.1	44.3	78.7	53.9	63.0	66.5	5.2	5.2	3.9	4.8	11	8	10	15	0	0	0	0	0	44	11	29	30	8	6	14	8	32	9																
Feb....	7	3	9	24	15	10	2	13	4	44.4	45.3	43.1	44.3	78.7	53.9	63.0	66.5	5.2	5.2	3.9	4.8	11	8	10	15	0	0	0	0	0	44	11	29	30	8	6	14	8	32	9																
Mar....	15	8	9	11	21	9	4	11	5	45.0	47.1	46.5	45.9	73.3	55.2	62.3	63.6	6.0	5.8	3.9	5.2	12	9	10	13	0	0	0	0	0	49	0	23	45	0	1	4	0	46	10																
Apr....	8	4	10	13	16	14	5	14	6	49.6	52.8	51.4	51.3	74.4	55.8	68.3	66.2	5.9	5.4	4.0	5.1	8	12	10	12	0	0	0	0	0	47	8	1	45	2	26	30	2	6	45	10															
May....	13	13	7	20	11	14	1	7	7	61.2	64.2	62.2	62.5	83.5	62.5	76.8	74.3	6.2	5.7	3.7	5.2	7	15	9	13	0	0	0	0	0	45	9	0	9	42	0	31	3	9	44	10															
June....	11	5	21	15	13	12	3	8	2	67.3	69.2	68.1	68.2	85.9	61.0	79.6	75.5	5.2	4.6	2.4	4.1	11	15	4	11	0	0	0	0	0	41	4	1	30	1	80	11	3	34	00																
July....	8	6	7	17	20	19	6	3	7	71.8	73.9	73.1	72.9	83.2	58.2	79.3	73.6	4.2	4.2	1.9	3.4	14	16	1	8	0	0	0	0	0	28	8	19	8	1	19	4	31	10	3	24	10														
Aug....	26	8	13	16	5	4	4	10	2	66.7	68.5	67.2	67.5	84.2	51.3	73.0	69.5	2.2	3.6	1.7	2.2	22	9	0	6	0	0	0	0	0	22	6	18	8	9	12	31	9	7	15	2															
Sept....	9	7	23	25	4	5	5	10	2	67.0	68.0	68.4	67.8	86.6	53.9	76.0	72.2	2.3	3.8	2.8	3.0	18	8	4	6	0	0	0	0	0	15	3	0	9	11	12	5	1	30	4	8	7	6													
Oct....	23	3	15	10	6	4	2	15	5	57.3	59.7	59.6	58.9	84.6	56.3	76.4	72.4	3.3	4.5	2.3	3.4	19	6	6	6	5	0	0	0	0	14	0	13	5	1	1	12	11	13	11																
Nov....	17	7	10	16	6	1	6	14	4	40.3	43.3	41.8	41.8	76.7	49.6	67.3	64.5	3.5	4.0	1.9	3.1	16	9	7	7	0	0	0	0	0	14	1	4	5	8	30	8	5	9	9																
Dec....	16	11	13	22	8	1	8	7	3	40.7	42.9	40.9	41.5	80.3	66.1	71.1	72.5	6.7	6.6	6.6	6.5	17	7	17	13	0	0	0	0	0	15	11	26	4	10	15	11	1	10	2																
Sums	180	80	145	299	133	125	47	125	54	640.5	668.6	653.3	653.4	968.8	686.6	860.2	841.6	65.9	63.8	33.1	31.6	150	131	85	126	2	25	84	29										
Means.	16.4	7.3	13.2	29.9	12.1	11.4	3.1	14.9	53.4	55.7	54.4	54.5	80.7	57.5	72.2	70.1	4.7	5.0	8.2	4.3	41.6	35.3	8.2	3.4	4.5	6.8	23.0	7.9	49	0	23	4	10									

* March.

† December.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 6.05 a. m., 2.05 p. m., and 10.05 p. m., local time.

Correction for instrumental error of barometer used: From 0.05 a. m., January 1, to 10.05 p. m., December 31, 1884, inclusive, — .008 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.270; February, 0.270; March, 0.260; April, 0.260; May, 0.250; June, 0.250; July, 0.240; August, 0.240; September, 0.230; October, 0.230; November, 0.220; December, 0.270.

REMARKS.—During the months of February, March, April, May, and June the Mississippi River rose to a great height, causing floods that inundated the country in this vicinity for miles around. The water spreading as far west as Monroe, La., with great damage to the levees on that side. The planting of crops was much retarded, while great uneasiness and apprehension was felt among the residents of the valley while the water remained above the danger line. The river fell steadily after about June 1.

FRED. W. MIXER,
Private, Signal Corps, U. S. A.

WASHINGTON, CITY—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—								Number of calms.	Dew-point				Relative humidity (per cent.).				Cloudiness (in tenths).				Number of days—									
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.		Washington time.				7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 33°.	Minimum below 33°.	Maximum above 90°.	Thunder-storms.	Aurora.	
										7 a. m.	3 p. m.	11 p. m.	Mean.																		
1884.																															
Jan.....	18	7	5	2	22	7	10	22	0	21.0	25.5	23.1	23.2	83.2	73.9	78.6	77.9	6.2	6.7	6.1	14	8	26	0	0	0	0	0	0	0	0
Feb.....	7	12	13	10	13	8	9	20	3	34.0	34.7	33.8	34.3	86.5	67.4	81.6	78.5	6.2	6.7	6.1	17	1	12	0	0	0	0	0	0	0	0
Mar.....	6	11	15	9	11	2	7	30	2	32.1	34.6	33.8	33.1	82.0	63.0	73.7	72.9	6.1	6.5	6.1	10	1	9	0	0	0	0	0	0	0	0
Apr.....	10	8	5	5	11	2	0	9	5	36.1	35.2	33.6	34.7	71.6	46.6	68.2	63.1	5.2	7.0	4.9	19	2	0	0	0	0	0	0	0	0	0
May.....	11	6	2	2	23	2	0	2	1	50.4	51.5	52.2	51.7	73.5	49.9	74.6	66.0	4.3	4.5	5.3	14	0	0	0	0	0	0	0	0	0	0
June.....	7	18	7	2	27	2	1	12	8	60.4	61.9	62.7	61.7	79.6	54.2	80.4	71.4	4.9	5.1	5.0	18	0	0	0	0	0	0	0	0	0	0
July.....	17	6	5	4	21	13	8	24	5	62.4	64.1	64.0	63.5	80.3	56.0	84.2	75.1	5.2	6.0	4.5	15	0	0	0	0	0	0	0	0	0	0
Aug.....	17	14	6	4	19	7	0	24	5	62.4	64.1	64.0	63.5	80.3	56.0	84.2	75.1	5.2	6.0	4.5	15	0	0	0	0	0	0	0	0	0	0
Sept.....	11	4	2	6	28	10	3	10	8	58.4	61.3	61.4	60.3	80.5	51.2	77.9	69.8	3.9	4.2	4.0	17	0	0	0	0	0	0	0	0	0	0
Oct.....	24	8	3	2	23	4	0	4	1	47.2	47.5	48.2	47.6	80.2	50.8	72.9	68.3	3.9	4.2	4.0	11	0	0	0	0	0	0	0	0	0	0
Nov.....	12	4	3	2	23	4	0	4	1	32.5	35.4	35.6	34.6	80.1	54.7	76.3	70.3	3.7	4.0	3.6	9	0	0	0	0	0	0	0	0	0	0
Dec.....	15	7	5	2	24	3	4	21	3	28.5	31.0	32.6	29.7	67.9	70.7	73.5	73.4	3.2	3.4	3.3	11	6	15	0	0	0	0	0	0	0	0
Sums ..	151	107	71	56	262	65	81	299	66	537.1	543.0	547.9	541.1	903.2	608.4	627.2	664.0	60.4	68.4	57.0	190	17	69	22	28	1	0	0	0	0	0
Means ..	12.7	9.7	5.5	5.1	12.9	5.9	7.4	11.8	6.0	43.9	45.7	45.7	45.1	80.3	58.0	77.3	72.0	5.0	5.7	4.8	52.5	4.0	13.9	2.9	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Percentages.

Correction for instrumental error of barometer used: From 7 a. m., January 1, to 11 p. m., December 31, 1884, inclusive, +.003 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.120; February, 0.120; March, 0.120; April, 0.120; May, 0.110; June, 0.110; July, 0.110; August, 0.110; September, 0.110; October, 0.120; November, 0.120; December, 0.120.

T. B. HARRISON,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

WEST LAS ANIMAS, COLO.

Location of office on December 31, 1884, Saint Angelo avenue, between Twelfth and Thirteenth streets.

[Latitude, 32° 4' N.; longitude, 103° 12' W. Elevation of barometer above sea-level, 3,800 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 7 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.				Wind.				Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Washington time.					Monthly mean.					Washington time.					Self-registering thermometer.					Any 3 consecutive 8-hourly measurements.				Maximum hourly velocity during month.					Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	7 P. M.		3 P. M.		11 P. M.	Highest.		Lowest.		Date.	Range.		7 P. M.		3 P. M.		11 P. M.	Monthly mean.		Maximum.		Date.	Absolute range.		Mean maximum.		Mean minimum.				Total amount.	Largest amount.	Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	In.	Th.	In.	Th.		In.	Th.	In.	Th.		In.	Th.	In.	Th.	In.	Th.		In.	Th.	In.	Th.		In.	Th.	In.	Th.	In.	Th.									In.	Th.	In.	Th.	In.	Th.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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• January.

† March.

‡ July.

§ February.

WEST LAS ANIMAS, COLO.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m. Washington time; Number of times observed blowing from—								Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—																					
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Number of calms.	Washington time.				Mean.		Clear.	Fair.	Cloudy.	On which .01 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 90°.	Thunder-forms.	Aurora.												
1894.	Jan.....	Feb.....	Mar.....	Apr.....	May.....	June.....	July.....	Aug.....	Sept.....	Oct.....	Nov.....	Dec.....	Sums ..	Percentages.																						
	9	7	10	10	4	2	0	83	13	0	8	14	16	11	44	375.7	373.4	383.8	363.4	654.6	465.9	767.6	723.4	50.7	48.2	53.1	47.5	173	61	77	87	167	51	39	0	
Means.	7.9	11.6	17.9	9.1	9.3	10.7	18.8	10.7	4.0	31.4	31.6	32.8	31.9	73.6	38.8	64.0	60.8	4.0	4.8	2.8	4.2	36.1	47.2	16.7	21.0	10.1	45.6	13.9	8.2	0						

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.15 a. m., 1.15 p. m., and 9.15 p. m., local time.

Correction for instrumental error of barometer used: From 5.15 a. m., January 1, to 9.15 p. m., December 31, 1884, inclusive, —.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.18; February, 4.12; March, 4.07; April, 3.86; May, 3.85; June, 3.77; July, 3.70; August, 3.74; September, 3.62; October, 3.49; November, 4.11; December, 4.13.

F. H. BRANDENBURG,
Sergeant, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

WEST LAS ANIMAS, COLO.

Location of office on December 31, 1884, Saint Angelo avenue, between Twelfth and Thirteenth streets.

[Latitude, 39° 4' N.; longitude, 103° 12' W. Elevation of barometer above sea-level, 3,890 feet. Elevation of exposed thermometer above ground, 23 feet. Elevation of rain-gauge above ground, 7 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.			Wind.					
	Washington time.					Monthly mean.	Highest.	Lowest.	Date.	Range.	Washington time.			Self-registering thermometers.			Total amount.	Any 3 consecutive 8-hourly measurements.	Maximum hourly velocity during month.		Prevailing direction.	Total movement.			
	7 P. M.	3 P. M.	11 P. M.	Monthly mean.	Maximum.						Minimum.	Date.	Absolute range.	Mean maximum.	Mean minimum.	Largest amount.			Date.	Miles.			Direction from—	Date.	
1884.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Jan.	24.101	24.057	24.065	24.084	24.443	24.615	1	.828	13.1	34.6	20.5	28.4	86.2	23.6	10.5	78.7	40.9	8.8	.26	.15	14.15	32	N.	9	5,373
Feb.	23.960	23.921	23.963	23.948	24.395	24.594	13	.891	15.1	36.0	22.3	28.5	71.3	24.7	22.7	92.9	41.1	11.4	.50	.13	11	44	W.	20	5,830
Mar.	23.894	23.842	23.874	23.870	24.305	24.504	13	1.045	27.0	51.3	37.9	34.8	79.3	20.3	23.7	90.1	56.8	24.0	1.19	.89	24	63	SW.	10	5,948
Apr.	23.852	23.805	23.855	23.838	24.338	24.539	13	.879	33.2	58.4	45.0	40.2	79.2	24.7	21.5	92.3	62.2	23.0	1.03	.73	18	69	SW.	13	7,540
May	23.022	23.973	23.051	23.005	24.325	24.525	21	.720	48.2	68.4	54.4	64.3	90.4	24.7	21.5	92.3	72.7	43.5	4.46	.72	19	69	NW.	4	5,174
June	23.033	23.007	23.051	23.037	24.230	24.430	18	.446	58.2	80.5	65.5	68.1	97.7	27.4	24.8	92.9	84.2	55.4	2.79	.59	9	49	NW.	26	5,094
July	23.038	23.965	23.005	23.013	24.263	24.463	9	.431	63.1	86.3	74.0	70.1	101.0	1	61.7	81.5	82.2	57.0	1.75	.73	10	40	NW.	1	5,539
Aug.	23.068	23.032	23.077	23.072	24.302	24.502	19	.569	64.9	82.5	69.6	70.1	101.0	1	61.7	81.5	82.2	57.0	2.17	.80	28	24	W.	7	5,823
Sept.	23.963	23.941	23.963	23.968	24.398	24.598	29	.897	54.2	82.1	68.4	68.4	90.5	9	57.4	80.7	86.7	51.7	.06	.05	26	23	E.	1	5,978
Oct.	23.192	23.084	23.073	23.070	24.394	24.594	16	.715	43.5	71.0	53.4	58.0	90.5	9	57.4	80.7	86.7	51.7	41.3	.19	13	23	S.	2	5,256
Nov.	23.126	23.073	23.123	23.107	24.394	24.594	21	.721	23.5	64.8	53.9	58.4	90.5	9	57.4	80.7	86.7	51.7	.23	.23	10	23	NW.	2	3,847
Dec.	23.906	23.906	23.904	23.943	24.394	24.594	21	.847	13.1	30.5	13.9	19.5	66.7	1	31.5	91.2	47.0	22.9	.72	.31	26	86	N.	4	4,557
Sum.	312.298	311.707	312.161	312.058	344.443	346.443	...	8.971	454.0	740.7	583.3	583.3	...	...	777.8	789.3	341.8	118.70	...	...	...	...	...	...	468,708
Means	24.094	23.976	23.013	23.004	24.443	24.643	11	.743	37.8	61.7	46.5	48.7	104.9	10	52.7	81.4	66.5	54.5	...	...	...	...	...	...	...

January. February. March. July.

• January.

• March.

• July.

• February.

WEST LAS ANIMAS, COLO.—Continued.

Month.	Winds at 7 a. m., 8 and 11 p. m. Washington time: Number of times observed blowing from—								Dew-point		Relative humidity (per cent.).		Cloudiness (in tenths).					Number of days—												
	Number of calms.												Washington time.																	
	North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	7 a. m.	8 p. m.	11 p. m.	Mean.	Clear.	Fair.	Cloudy.	On which, 0.1 inch or more precipitation fell.	Maximum below 32°.	Minimum below 32°.	Maximum above 80°.	Thunder-storms.	Aurora.	
1884.																														
Jan.....	5	10	16	4	2	9	23	13	0	14.5	13.8	12.5	12.5	64.7	47.3	75.9	69.9	3.1	4.1	3.0	3.4	14	16	1	9	11	31	0	0	0
Feb.....	7	11	16	4	4	4	26	10	1	11.7	16.2	15.6	14.5	87.0	74.3	78.9	73.5	3.7	4.2	2.8	4.3	9	16	4	9	9	29	0	0	0
Mar.....	11	4	18	10	13	13	19	13	1	20.5	17.0	20.1	19.2	74.1	80.8	53.4	52.5	4.5	5.1	2.8	4.4	9	18	4	4	15	14	0	0	0
Apr.....	14	7	9	12	4	10	18	12	4	24.5	22.1	27.8	25.5	80.0	73.7	57.7	53.8	4.5	5.1	2.9	4.5	4	18	4	4	24	15	0	0	0
MAY.....	14	8	14	17	7	9	12	7	9	40.5	36.8	40.6	39.1	81.1	84.3	62.1	59.8	4.5	6.3	5.9	5.5	6	16	8	8	10	10	0	0	0
June.....	2	8	27	10	8	13	5	9	8	52.2	48.6	52.4	51.1	86.7	80.8	56.7	53.1	4.2	4.2	3.6	4.8	10	10	4	12	0	0	0	0	0
July.....	5	18	21	9	9	11	13	8	4	55.0	50.2	58.7	53.0	78.6	73.5	54.5	53.1	4.1	4.2	3.2	3.9	11	15	5	5	0	0	0	0	0
Aug.....	1	11	23	10	11	12	13	8	3	60.7	47.0	51.1	48.6	86.7	83.4	66.2	63.4	3.1	4.2	3.2	4.0	12	12	7	8	0	0	0	0	0
Sept.....	6	13	9	8	16	16	11	10	3	41.9	39.1	43.8	41.3	66.2	66.2	71.1	65.0	2.6	3.1	3.2	3.8	13	12	6	7	0	0	0	0	0
Oct.....	6	13	11	9	22	12	14	6	1	38.0	45.4	43.6	42.3	82.8	82.8	75.7	63.8	4.1	4.8	3.1	3.1	13	13	1	7	0	0	0	0	0
Nov.....	8	13	9	5	3	9	20	21	2	21.6	27.7	23.8	24.4	83.6	83.6	67.9	63.8	3.4	3.6	2.4	3.1	10	14	7	6	16	31	0	0	0
Dec.....	8	13	18	2	6	2	23	11	11	8.7	15.3	10.0	11.3	87.9	82.3	79.7	76.6	4.6	5.9	3.8	4.8	10	14	7	6	16	31	0	0	0
Sums ..	87	127	196	100	102	118	206	118	44	376.7	379.4	383.8	383.4	954.6	465.9	767.6	723.4	47.5	53.1	46.2	50.7	132	173	61	77	37	167	51	30	0
																			Percentages.											
Means.	7.91	6.17	9.9	9.1	9.3	10.7	18.9	10.7	4.0	31.4	31.6	32.8	31.9	79.6	33.8	64.0	60.8	4.0	4.8	3.8	4.2	36.1	47.2	16.7	21.0	10.1	45.6	13.9	8.2	0

NOTE.—7 a. m., 8 p. m., and 11 p. m., Washington time, correspond to 5.15 a. m., 1.15 p. m., and 9.15 p. m., local time.

Correction for instrumental error of barometer used: From 5.15 a. m., January 1, to 9.15 p. m., December 31, 1884, inclusive, —.002 inch.

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 4.13; February, 4.12; March, 4.07; April, 3.86; May, 3.85; June, 3.77; July, 3.75; August, 3.74; September, 3.81; October, 3.93; November, 4.11; December, 4.15.

F. H. BRANDENBURG,
Sergeant, Signal Corps, U. S. A.

Metereological summary for the year ending December 31, 1884—Continued.

WILMINGTON, N. C.

Location of office on December 31, 1884, Western Union office, in Dawson Bank building, Front street.

[Latitude, $34^{\circ} 14' N.$, longitude, $77^{\circ} 57' W.$ Elevation of barometer above sea-level, 53 feet. Elevation of exposed thermometer above ground, 28 feet. Elevation of rain-gauge above ground, 44 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.			Monthly mean.	Higbest.	Date.	Lowest.	Range.	Washington time.			Self-registering thermometer.					Total amount.	Any 3 consecutive 3-hourly measurements.	Maximum hourly velocity during month.			Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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January.

April.

July.

Meteorological summary for the year ending December 31, 1884—Continued.

WINNEMUCCA, NEV.

Location of office on December 31, 1884, corner of Bridge street and Fifth avenue.

[Latitude, 40° 50' N.; longitude, 117° 49' W. Elevation of barometer above sea-level, 4,358 feet. Elevation of exposed thermometer above ground, 18 feet. Elevation of rain-gauge above ground, 5 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.								Precipitation.				Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Washington time.			Monthly mean.	Highest.	Date.	Lowest.	Date.	Range.	Washington time.				Self-registering thermometers.				Mean maximum.	Mean minimum.	Total amount.		Any 3 consecutive 8-hourly measurements.		Maximum hourly velocity during month.			Prevailing direction.	Miles.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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* Observations commenced 7 a. m., December 1.

WINNEMUCA, NEV.—Continued.

[illegible]

Novra, -7 a. m., 3 p. m., and 11 p. m. Washington time, correspond to 4.17 a. m., 12.17 p. m., and 8.17 p. m., local time. Correction for instrumental error of barometer used: From 4.17 a. m., December 1, to 8.17 p. m., December 31, 1894, inclusive, +.010 inch.

CHAS. A. READ,
Private, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

YANKTON, DAK.

Location of office on December 31, 1884, corner Third and Capitol streets.

[Latitude, 43° 54' N.; longitude, 97° 28' W. Elevation of barometer above sea-level, 1,223 feet. Elevation of exposed thermometer above ground, 20 feet. Elevation of rain-gauge above ground, 26 feet.]

Month.	Barometer readings (corrected for temperature and instrumental error only).										Temperature.						Precipitation.				Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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• January.

† March.

‡ June.

§ July.

YANKTON, DAK.—Continued.

[illegible]

December.

*** Ten days only.**

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.38 a. m., 1.38 p. m., and 9.38 p. m., local time.

NOTE.—7 a. m., 3 p. m., and 11 p. m., Washington time, correspond to 5.33 a. m., 1.33 p. m., and 9.33 p. m. local time. Correction for instrumental error of barometer used: From 5.33 a. m., January 1, to 9.38 p. m., December 31, 1884 inclusive, +.011 inch.

Correction for instrumental error of barometer used: from 0.35 mm. to 0.6 mm. for the p. m., December 31, 1904; inclusive, + 0.1 mm. The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 1.42; February, 1.49; March, 1.39; April, 1.34; May, 1.28; June, 1.28; July, 1.27; August, 1.27; September, 1.29; October, 1.37; November, 1.33; December, 1.43.

REMARKS.—January 1 and 8, solar halo; February 5 and 12, solar halo; February 5 and 13, parheliion; April 24, aurora; December 31, solar halo.

E. H. THOMPSON,
Captain, Signal Corps, U. S. A.

Meteorological summary for the year ending December 31, 1884—Continued.

YUMA, ARIZ.

Location of office on December 31, 1884, quartermaster's office.

[Latitude, 33° 45' N.; longitude, 114° 30' W. Elevation of barometer above sea-level, 141 feet. Elevation of exposed thermometer above ground, 5 feet. Elevation of rain-gauge above ground, 21 feet.]

Barometer readings (corrected for temperature and instrumental error only).														Temperature.										Precipitation.		Wind.			Total movement.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Washington time.				Monthly mean.				Highest.		Lowest.		Range.		Washington time.				Self-registering thermometers.				Any 3 consecutive 8-hourly measurements.	Total amount.	Date.	Maximum hourly velocity during month.		Prevailing direction.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
7 p. m.	3 p. m.	11 p. m.	In.	In.	In.	In.	In.	In.	In.	In.	In.	7 a. m.	3 p. m.	11 p. m.	Monthly	Mean.	Maximum.	Date.	Minimum.	Date.	Absolute range.				Mean maximum.	Mean minimum.		Largest amount.		Date.	Miles.	Direction from—	Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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* Inapplicable.
 * No observation taken on the 12th.
 * One 7 a. m. observation missed.

* For 24 days only.
 * January.

* October.
 * June.

* February.
 * For 300 days only.

FUMA, ARIZ.—Continued.

Month.	Winds at 7 a. m., 3 and 11 p. m., Washington time: Number of times observed blowing from—							Dew-point.		Relative humidity (per cent.).		Cloudiness (in tenths).		Number of days—							River.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	North.	Northeast.	East.	Southeast.	South.	West.	Northwest.	Number of calms.	Washington time.				Percentage.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
									7 a. m.	3 p. m.	11 p. m.	Mean.	7 a. m.	3 p. m.	11 p. m.	Mean.	Clear.	Rain.	Cloudy.	On which .01 inch or more precipitation fell.		Minimum below 32°.	Maximum above 30°.	Thunderstorms.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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December,

NOTE.—7 a. m., 3 p. m. and 11 p. m., Washington time, correspond to 4.30 a. m., 12.30 p. m., and 8.30 p. m., local time.

(Correction for instrumental error of barometer used: From 4.30 a. m., January 1, to 8.30 p. m., December 31, 1884 inclusive, $-.011$ inch.)

The barometric observations may be reduced to sea-level by adding the following constants for the various months: January, 0.150; February, 0.150; March, 0.150; April, 0.150; May, 0.150; June, 0.140; July, 0.140; August, 0.140; September, 0.140; October, 0.140; November, 0.150; December, 0.150.

J. T. BARBER,
Private, Signal Corps, U. S. A.

APPENDIX 53.

DESCRIPTION OF DISTRICTS FOR WHICH INDICATIONS ARE PUBLISHED.

Eastern Gulf States.—Mississippi, Alabama, western Georgia, northwestern Florida, and the portion of Louisiana lying east of the Mississippi river.

Extreme Northwest.—A belt of country about 170 miles broad, extending from Duluth, Minn., to Fort Buford, Dak.

Lower Lakes.—A belt of country about 80 miles wide extending from Lake Champlain to the Indiana state line, including the region south of and adjacent to Lakes Erie and Ontario, and southeastern Michigan.

Middle Atlantic States.—New Jersey, Delaware, the District of Columbia, and the portions of New York, Pennsylvania, Virginia, and Maryland lying east of the Alleghenies.

Middle Pacific Region.—That portion of California west of the Sierra Nevadas and north of the thirty-seventh parallel of latitude.

Middle Plateau.—Western Colorado and those portions of Nevada and Utah lying north of the thirty-seventh parallel of latitude; the southwest corner of Wyoming and the portion of California lying east of the Sierra Nevadas and north of the thirty-seventh parallel of latitude.

Middle Slope.—Eastern Colorado, southwestern Nebraska, western Kansas, northwestern portion of the Indian Territory, a portion of northern Texas, and also of northeastern New Mexico.

Missouri Valley.—A belt of country 200 miles broad, extending southeast from the forty-sixth parallel of latitude to the Arkansas state line.

New England States.—Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island.

Northern Slope.—The portions of Montana and Wyoming lying east of the Rocky Mountains, southwestern Dakota, and northwestern Nebraska.

North Pacific Region.—The portions of Oregon and Washington Territory lying west of the Cascade range.

Northern Plateau.—A portion of western Wyoming, western Montana, Idaho, and the portions of Oregon and Washington Territory lying east of the Cascade range.

Ohio Valley and Tennessee.—The belt of country, about 350 miles broad, including Tennessee, Kentucky, southeastern Illinois, southern Indiana, and Ohio, southwestern Pennsylvania, and West Virginia.

Rio Grande Valley.—That portion of southwestern Texas between the Rio Grande and Rio Colorado rivers below the junction of the Rio Pecos with the Rio Grande.

South Atlantic States.—North and South Carolina; the portion of Georgia east of the eighty-fourth meridian, and northeastern Florida.

Southern Slope.—Southeastern New Mexico, central and western Texas.

South Pacific Region.—The portion of California west of the Sierra Nevadas and south of the thirty-seventh parallel of latitude.

Southern Plateau.—Western New Mexico, Arizona, and southeastern California.

Upper Lakes.—Lakes Huron, Michigan, and Superior with adjacent territory.

Upper Mississippi Valley.—The belt of country, about 250 miles broad, between Superior, Wis., and Breckenridge, Minn., on the north, and the Arkansas state line on the south.

Western Gulf States.—Arkansas, the portion of Louisiana west of the Mississippi river, the southeastern portion of Indian Territory, and eastern Texas.

APPENDIX 54.

REPORT ON THE DISPLAY OF COLD-WAVE SIGNALS.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, June 30, 1885.

SIR: I have the honor to submit my report upon the work performed in connection with the predictions of cold waves and the display of the cold-wave signal for the year ending June 30, 1885, prefacing the report with a brief history of this recent though important branch of Signal-Service work.

There is scarcely an industry which is not more or less affected by a sudden and marked fall in temperature; and especially is this true of agriculture, stock-farming, cotton-planting, and fruit-shipping. Dealers in perishable goods, packed meats, and many others are also unfavorably affected by unexpected changes in temperature.

This service has long appreciated the value of such information, but it was not until late in 1883 that it was possible to inaugurate the work of giving warnings of the approach of cold waves from twenty-four to forty-eight hours in advance of their appearance.

The plan adopted and now in successful operation is as follows:

Whenever it is anticipated that the temperature will fall suddenly from 15° to 30°, or more, in any section of the United States, the observers in charge of Signal-Service stations in that section are directed, by telegraph, from twenty-four to forty-eight hours in advance, to hoist the cold-wave signal at their stations. The telegrams give the number of degrees that the temperature is expected to fall, and, immediately on their receipt, the observers at the stations selected, display the cold-wave flag from a high staff erected either on the office building, or at some prominent point in the city where the signal is conspicuous and readily seen by the public. The cold-wave signal is a white flag, 6 or 8 feet square, with a black center about 2 feet square. The signal is lowered upon receipt of orders from this office, when it is believed the temperature has reached the minimum. At stations other than Signal-Service stations the signal is lowered twenty-four hours after the order to hoist is received.

By sending out the warnings in this manner, all persons whose business is liable to be affected by cold weather, or sudden changes in temperature, are enabled to take the precautions necessary by being informed in ample time of the approach of cold waves.

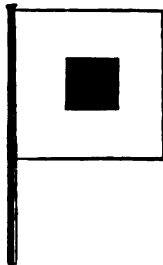
The system of warnings thus inaugurated met with immediate favor throughout the entire country, and the press in most emphatic terms indorsed the efforts made by the service. All branches of agriculture, the railroad companies, extensive fruit dealers, cotton-planters, manufacturers, and others expressed the greatest satisfaction with the system, and in many instances individuals have expended considerable money in order to obtain additional information by telegraph, in the purchase of flags, and in the erection of flag-staffs in towns adjacent to Signal-Service stations.

The railroad and telephone companies have, almost without exception, co-operated with the service in disseminating the information by telegraph and telephone to the cities and stations on their lines. This is done without any expense whatever to the Government, the cold-wave messages sent from this office to the various Signal Service stations being duplicated at those places and sent by the observers to the managers of the railroad and telephone lines for transmission.

All means available are used by the service in giving publicity to the cold-wave warnings, in order that the greatest benefit possible may result from each forecast.

The warning is published in the Farmers' Bulletin, in bold type, and thousands of farmers are thus informed of the coming fall in temperature.

A large number of circulars have been prepared and forwarded to the postmasters who receive the information through the Farmers' Bulletin, giving the cost of cold-wave flags and soliciting their co-operation in displaying the signal at their post-offices whenever the warning is published.



Cold-wave signal.

Any one not in the vicinity of a Signal Service station can obtain the warnings by paying the cost of telegraphing.

During the present year this system has been greatly improved and extended. The number of stations displaying the signal has been increased and additional facilities employed for disseminating the warnings.

Owing to the very limited appropriations made for the Signal Service, this office has been able to furnish flags only to regular stations of the service and to pay the cost of telegraphing the reports. An annual appropriation of a few thousand dollars would enable the system of cold-wave warnings to be extended over the greater part of the United States, to the benefit of thousands who cannot under existing conditions be brought within the scope of its usefulness.

The following are the instructions governing observers in displaying the cold-wave signal:

The signal is hoisted upon the receipt of a message from this office to "hoist cold-wave signal;" and lowered upon the receipt of the message "cold-wave signal down."

The receipt of orders to hoist or lower cold-wave signals is acknowledged by telegraph thus: "Hoist cold-wave signal received 10 a. m.; cold-wave signal down received 7 p. m." A report by letter is made after each display, stating whether the signal was or was not justified, and giving the maximum and minimum temperatures during the display. This letter also states whether the warning was considered by the business interests and the public generally as being sufficiently in advance to be of decided benefit. Clippings from local newspapers, commenting upon the display, or showing any advantages that may have resulted therefrom, are attached to these letters.

Two copies of Form 112b (record of cold-wave signals) are made out each month; one copy is forwarded to this office, the other is filed with the station records.

Observers communicate with the several railroad, telegraph, and canal officials at their stations, furnish them copies of cold-wave orders, and endeavor to secure their co-operation in sending the messages to all points under their control without cost to the United States, as the results of such wide distribution of these dispatches are found to be of great benefit to the general public. Notes are made on Form 112b showing the names of persons, firms, and companies to which each message is given.

Cold-wave signals are not ordered unless a temperature of 45°, or lower, is anticipated. When the temperature is expected to fall 20°, or more, in any district, and not reach 45°, a "cool wave approaching" is announced in the indications issued from this office. No signals are displayed for cool waves, nor are cold-wave stations notified in any other manner than through announcement made in the indications. Printing stations give the "cool wave approaching" announcement such prominence as their facilities will permit when it refers to the district in which the printing station is located.

At stations where cautionary signals are displayed, and only one flag-staff is available, the cautionary signal has preference—that is, the cold-wave flag gives way to the cautionary flag under all circumstances.

At stations where no flag-staff is available on the building in which the office is located, the observer endeavors to obtain permission from some one in the vicinity of the office, who has a flag-staff, to use it for displaying the cold-wave flag, without expense to the United States.

Under no conditions are the cold-wave flag and the cautionary signal displayed on the same staff at the same time.

The following is an extract from a letter dated June 26, 1885, from Hon. J. F. Webb, mayor of the city of Lebanon, Ill.:

"I consider the cold-wave signal of more practical benefit to the public at large than any recent improvement in the United States Signal Service. I know, personally, of many instances during the past winter where farmers were saved from serious losses, in the shipment of potatoes and apples, by the timely warning of the cold-wave signal. Other instances I know by report, where losses were sustained in the shipment of live-stock (cattle and hogs) by neglecting or disregarding the warning.

"Our citizens and farmers have learned to rely on the forecasts given, almost implicitly, and it is not too much to say that in my judgment the property saved by its use during the past severe winter in the Mississippi Valley would pay for its maintenance for a generation."

The following extracts are from the reports of our observers, and indicate the importance attached to the cold-wave warnings and their value in leading to the preservation of property.

Albany, N. Y.: "Great reliance is placed on these warnings and much satisfaction is expressed by every one in regard to them. It is difficult to estimate the pecuniary benefits realized." (Letter November 25, 1884.)

"Have furnished warnings to Delaware and Hudson Canal Railroad Company and to the superintendent of canals. The canal company transmit the information over their

wires free of charge. The railroad officials seemed much interested in this matter, and offered to do anything that has been done by other companies." (Letter November 25, 1884.)

"All displays during January, 1885, have been justified. This manner of publishing predictions in advance of cold-waves is more popular than through any other course yet adopted. Office is visited by scores of people. Dealers in fruit, oysters, and fish, and the ice companies are specially interested." (Form 112b, January, 1885.)

"The interest in these warnings is constantly increasing." (Form 112b, March, 1885.)

Atlanta, Ga.: "The following railroad companies send the warnings to points on their roads, namely: Richmond and Danville, the Western and Atlantic, Central, Atlanta and West Point, and Georgia Pacific." (Letters November 26, 1884, and January 13, 1885.)

Auburn, Ala.: "These signals are of great benefit to physicians, gardeners, farmers, and grocers." (Form 112b, December, 1884.)

"All cold-wave predictions this winter have been verified. The people have been greatly interested." (Form 112b, March, 1885.)

Bangor, Me.: "Signals are of great benefit to persons engaged in storing ice." (Form 112b, January, 1885.)

Baltimore, Md.: "Arrangements have been made for furnishing copies of the orders to the Baltimore and Ohio Telegraph and Railroad, Western Union, and Bankers' and Merchants' Telegraph Companies. The officials state that they will give the information the widest publicity possible through their numerous offices in this city." (Letter November 3, 1884.)

"The importers of tropical fruits realize great benefit from the warnings, as they are enabled to protect their fruits on the wharves, and in exposed places, also during transit on the cars to distant points. The oyster-packers are also greatly benefited as, on notice being given of the approach of a cold-wave, they make large shipments of oysters to western cities, where they are readily sold." (Letter November 25, 1884.)

Buffalo, N. Y.: "Cold-wave orders are sent to all telephone, telegraph, and railroad officials, and by them distributed over their several sections. The orders are also published in every paper printed in Buffalo." (Letter November 2, 1884.)

"Produce dealers receive much benefit from these warnings and state that goods are shipped on the strength of Signal Service reports." (Letter November 19, 1884.)

"All the cold-wave signals displayed during January gave general satisfaction to the public, and are considered by the press and public as the best information issued by the Service." (Form 112b, January, 1885.)

"Produce merchants, roofers, fish and ice dealers, express companies, &c., acknowledge great service rendered by the displays." (Form 112b, March, 1885.)

Boston, Mass.: "The following railroads will send these warnings to the stations along their roads, viz: Old Colony; New York and New England; Boston and Maine; Boston and Lowell; and Eastern." (Letter November 15, 1884.)

Cairo, Ill.: "The following railroads transmit the warnings over their wires to points on their roads, viz: Illinois Central; Wabash, Saint Louis and Pacific; Mobile and Ohio; Iron Mountain; and Texas and Saint Louis narrow gauge." (Letter December 13, 1884.)

"The display of December 15-19, 1884, resulted in saving four car-loads of perishable stuff; the steamers of the Anchor Line were telegraphed and sought good harbors; and a number of valuable tropical animals belonging to a menagerie were comfortably housed." (Letter December 21, 1884.)

"Farmers and dealers in perishable stuffs saved goods valued in all at \$3,400." (Form 112b, March, 1885.)

Chicago, Ill.: "The following railroad companies will send the warnings, viz: Chicago and Alton; Chicago and Grand Trunk; Chicago, Rock Island and Pacific, and Chicago and Eastern. The Baltimore and Ohio Telegraph Company will also send them." (Letter November 27, 1884.)

Cleveland, Ohio: "The following railroad companies transmit the warnings over their lines, viz: Cleveland, Columbus, Cincinnati and Indianapolis; New York, Portland and Ogdensburg; Lake Shore and Michigan Southern; New York, Chicago and Saint Louis." (Letter November 26, 1884.)

"The service has been very accurate in these warnings. The public now have unbounded confidence in the weather department. The observer is often consulted by interested parties and great benefit is derived." (Form 112b, February, 1885.)

Chattanooga, Tenn.: "The Western and Atlantic and the Georgia division East Tennessee and Virginia Railroad Companies will adopt any feasible plan for distributing the cold-wave information over their lines." (Letter November 27, 1884.)

"Displays are watched with interest and acted upon by the public." (Form 112b, November, 1884.)

"Farmers across the Tennessee river look for the warnings and will request the county court to expend \$50 for additional flag-staff." (Form 112b, January, 1885.)

Cincinnati, Ohio: "Warnings will be telegraphed by the following railroad companies to all stations on their roads, viz: Cincinnati, New Orleans and Texas Pacific; Cincinnati, Indianapolis, Saint Louis and Chicago; Cincinnati, Louisville and Nashville; Cleveland, Columbus, Cincinnati and Indianapolis; Cincinnati, Washington and Baltimore; Pittsburg, Cincinnati and Saint Louis, and the Ohio and Mississippi." (Letter November 8, 1884.)

"Produce and fruit merchants, florists and gardeners much interested." (Forms 112b, November, 1884, and March, 1885.)

Columbus, Ohio: "Signals are watched closely by the public and business men, and the warnings are received with great favor." (Forms 112b, November and December, 1884.)

Davenport, Iowa: "The following railroad companies will promptly send the warnings to all places under their control, viz: Chicago, Rock Island and Pacific; Chicago, Burlington and Quincy; Chicago, Milwaukee and Saint Paul. They will also be sent by the Western Union Telegraph Company. The manager of the Chicago, Rock Island and Pacific has consented to attach a flag, similar to the cold-wave flag, to all express trains on this division of the road." (Letter December 4, 1884.)

Des Moines, Iowa: "Arrangements are completed with the manager of the telegraph company to transmit cold-wave warnings over all the wires from his office. This includes the wires of the several railroad companies." (Letter November 26, 1884.)

"The warning of December 30, 1884, enabled the railroad companies to save about all of their perishable freight." (Letter January 3, 1885.)

"Warnings are of great value to the railroad officials and to shippers of perishable goods." (Form 112b, January, 1885.)

Detroit, Mich.: "The newspapers spread the information throughout the State; commission merchants show great interest in the signal; the service can congratulate itself upon the success that has attended the display of cold-wave signals at this station." (Letter October 23, 1884.)

"The Board of Trade is highly pleased with the success of this signal in Detroit. Telephone calls are received daily from Pontiac and Almont, Mich., during cold snaps, relative to the weather. The signal fills a long felt want. The Detroit, Lansing and Northern Railway will transmit all cold-wave warnings over their wires." (Letter November 19, 1884.)

"Mr. A. H. Boies, Hudson, Mich., states that he has nearly completed arrangements for the display of cold-wave signals by establishing a circuit of flag-poles among the farmers for miles around, using his station as a central point for disseminating the warnings. The warnings are sent from Detroit by telegraph to Mr. Boies." (Letter May 21, 1885.)

Galveston, Tex.: "The observer has made arrangements with the various railroad companies and the press by which the warnings are given general circulation." (Letter November 15, 1884.)

Greencastle, Ind.: "Warnings are beneficial to all classes. The displays have led to great interest in weather changes and study of meteorological reports by the people." (Forms 112b, November, 1884, and February, 1885.)

Jacksonville, Fla.: "The meteorological committee state that 'the establishment of the cold-wave warning signal at Jacksonville is highly appreciated by the board of trade and by the citizens of Florida generally.'" (Letter December 3, 1884.)

"Warnings are beneficial to fruit and vegetable growers. Fires are built in groves in the vicinity for the protection of fruit, &c." (Form 112b, December, 1884.)

Keokuk, Iowa: "Warnings are sent over the lines of the Saint Louis, Keokuk and Northwestern Railroad and the Chicago, Rock Island and Pacific Railroad." (Letter November 27, 1884.)

"The Chicago, Rock Island and Pacific Railroad Company contemplate carrying miniature cold-wave flags on all their passenger trains leaving Keokuk. If done, this will give the warnings great publicity." (Letter December 14, 1884.)

"Railroad and ice companies, fruit-dealers, and shippers of potatoes, especially benefited." (Forms 112b, January and February, 1885.)

Leavenworth, Kans.: "Warnings will be promptly transmitted to all points on the Chicago, Rock Island and Pacific Railroad, and the Kansas Central Division Union Pacific Railroad." (Letter November 26, 1884.)

"Every signal display during January, 1885, was decidedly useful to the business interests in this vicinity, and the public generally keep a close lookout for the warnings, and appreciate them." (Form 112b, January, 1885.)

Little Rock, Ark.: "The reports are furnished the chief operators Memphis and Little Rock Railroad; Fort Smith and Little Rock Railroad; Little Rock, Mississippi River and Texas, and the Saint Louis, Iron Mountain and Southern Railroad, who send them to every operator along the lines, with instructions to make the information as public as possible.

The railroad companies give hearty support to anything which tends to improve crops or the condition of the country." (Letter November 16, 1884.)

Logansport, Ind.: "The cold-wave warnings are of vast benefit to the farmers and citizens here. Hundreds read the 'Farmers' Bulletin.' Both the press and public are pleased that these warnings are given. The signals have brought the service and its workings prominently before our people. As soon as the flag is raised here the trainmen inform the small offices along the road, and thus the flags at these stations are raised within an hour or so after the one here. Adjacent towns receive telegrams at their own expense." (Forms 112b, October and November, 1884, January and February, 1885.)

Louisville, Ky.: "Copies of cold-wave warnings are furnished the Ohio Valley Telephone Company; Chesapeake, Ohio and Southwest, and Louisville and Nashville Railroads and will be transmitted over their lines to 108 points in Kentucky, Tennessee, and Indiana. There are 96 railroad and 12 telephone stations." (Letter November 4, 1884.)

Milwaukee, Wis.: "The cold-wave displays are greatly appreciated by commission and railroad men. A great amount of property has been saved by the warnings." (Letter December 21, 1884.)

"The general superintendent Chicago, Milwaukee and Saint Paul Railway states 'This is the kind of information I am always glad to get; please let me have such at any time, for it will be of advantage to us, and will keep the people along our lines posted.'" (Letter October 22, 1884.)

Memphis, Tenn.: "Cold-wave warnings are telegraphed by the following railroad companies to stations along their lines, viz: Memphis and Charleston; Chesapeake, Ohio and Southwestern, and Louisville and Nashville. The Telephone Exchange and Pacific Express Company also send the messages to all stations on their lines." (Letter November 24, 1884.)

"Displays are beneficial to farmers, river men, business men, horticulturists, and shippers of produce." (Forms 112b, January and February, 1885.)

Nashville, Tenn.: "Secretary Baker, of the Cumberland Telephone Exchange, repeats cold-wave warnings to 87 towns in Tennessee and Kentucky." (Letter December 4, 1884.)

"Copies of warnings are delivered to the superintendent Louisville and Nashville Railroad, president Nashville, Chattanooga and Saint Louis Railroad, manager Western Union Telegraph office, Nashville. These gentlemen express themselves as more than grateful for these advantages." (Letter November 7, 1884.)

Additional cold-wave flags are displayed from the Capitol building and the Penitentiary at Nashville; Menees & Patton's drug store, Springfield, Tenn.; J. W. Wallace's office, Shelbyville, Tenn.; Prewitt & Co's. mill, the buildings of the National Manufacturing Company, and the Southern Pump Company, in Nashville, and at Mr. J. H. Jordan's house, 7 miles from Nashville. (Form 112b, February, 1885.)

"The mayor of Gallatin, Tenn., contemplates the erection of a flag-staff for the display of cold-wave signals, and it is learned that other towns within a radius of 90 miles of Nashville intend to do the same." (Letter December 23, 1884.)

New Haven, Conn.: The chairman of the meteorological committee Chamber of Commerce, in letter of February 2, 1885, states: "The cold-wave signal recently added has proven and will continue to prove of great value, not only to our market gardeners, nurserymen, and florists, but to a very large industry, viz: The oyster trade, as it gives those engaged in it warnings of the changes in temperature, consequently the best time to manipulate the products of their trade. This industry has of late years become of great value, as in the waters of Long Island Sound, on the Connecticut shore contiguous to us, there are over 4,500 acres under oyster cultivation which, in the near future, will represent an interest of millions of dollars."

New Orleans, La.: "Cold-wave warnings are sent to all the principal points reached by the Western Union Telegraph Company in Louisiana; all the larger towns on the Texas and Pacific Railroad; all along the line of the Morgan's Louisiana and Texas Railroad; the Ocean Tow-boat Telegraph line transmits all order to Port Eads and Point a la Haché; the two Lance Coast Packet boats carry flags for the benefit of sugar planters along the lower coast." (Letter November 29, 1884.)

New York City, N. Y.: "Cold-wave signals have met with universal favor and are deemed of particular value by the members of the different exchanges." (Letter October 16, 1884.)

"Warnings are telegraphed over the New York, Ontario and Western Railroad lines. Arrangements have been made by which all the exchanges, principal business houses, theaters, clubs, hotels, &c., in New York, Brooklyn, and Jersey City are advised of the approach of cold waves within a few minutes of the receipt of the orders. The New York Central and Hudson River Railroad and the New York, West Shore and Buffalo Railroad also receive the information." (Letters November 11 and December 3, 1884.)

Norfolk, Va.: On June 9, 1885, the general manager Norfolk Southern Railroad Company issued the following order:

"From July 1 proximo the United States Signal Service warnings of the approach of cold waves indicating a fall of temperature below 45° will be announced from Berkley to telegraph stations on line of this railroad. Operators at those stations will forward the warnings to Centreville, Shawborough, Okisko, Hickory Ground, Camden Court House, and Windfall by the first train.

"On receipt of the warnings, agents will immediately display the cold-wave signal, a white flag with black centre, from the flag-staff on the station platforms, and keep it displayed for the number of hours mentioned in the order, when it should be lowered unless a second warning is received.

"Operators will duplicate the order, as received, for distribution to above-named stations; and agents will post the same at all stations where received.

"The warnings will be given from twenty-four to forty-eight hours in advance of the cold wave, and will indicate probable duration and fall of temperature.

"In this matter the railroad company co-operates with the United States Signal Service for the benefit of agricultural interests along the road; and agents will be expected to make every effort to give the undertaking practical effect."

Philadelphia, Pa.: "Warnings are of benefit to vegetable and fruit shippers and oystermen, and have become almost indispensable." (Form 112b, March, 1885, and letter April 4, 1885.)

Rochester, N. Y.: "The benefits derived from these warnings are very general to all classes. Shippers of perishable produce and dealers in fresh meats are greatly benefited. The warnings are duplicated by flag at Richmond Mills (8 miles south of city) and give great satisfaction to the farmers and millers in that vicinity." (Forms 112b, December, 1884, and January, 1885.)

Shreveport, La.: "Warnings are telegraphed over the Texas and Pacific Railroad, and the New Orleans Pacific Railroad." (Letter December 17, 1884.)

"Of great benefit to dealers in fruit and produce and there is a feeling of much satisfaction and interest in the cold-wave signals at this point." (Letter December 18, 1884.)

"The display of December 16, 1884, resulted in saving \$3,500 worth of goods." (Letter December 19, 1884.)

"The telephone companies co-operate in distributing the warnings to neighboring towns." (Letter January 13, 1885.)

Toledo, Ohio: "The following railroads and telegraph companies have promised hearty co-operation in distributing the cold-wave warnings, viz: Lake Shore and Michigan Southern; Dayton and Michigan; Columbus, Hocking Valley and Toledo; Toledo and Ann Arbor; Pennsylvania and Northwestern Ohio; Toledo, Cincinnati and Saint Louis; Wheeling and Lake Erie; Ohio Central; Toledo and Indianapolis; Michigan and Ohio; Western Union, and Bankers and Merchants' Telegraph companies." (Letter November 27, 1884.)

"Arrangements will be made by which the warnings will reach more than 200 towns in Ohio, Michigan and Indiana." (Form 112b, November, 1884.)

Pittsburg, Pa.: "Warnings are telegraphed over the lines of the Allegheny Valley Railroad and the Pittsburg division Baltimore and Ohio Railroad." (Letters November 19, 1884, and December 6, 1884.)

"Great interest is manifested by the public. During displays visitors are almost continuously in the office after information. Shippers of goods, coal and river men, and people in all avocations, are interested in these warnings." (Form 112b, January, 1885.)

Saint Louis, Mo.: "Warnings will be sent to all stations on the following roads, viz: Saint Louis and San Francisco; Louisville and Nashville; Saint Louis and Cairo; Wabash, Saint Louis and Pacific; and Saint Louis, Keokuk and Northern." (Letter November 15, 1884, local records December, 1884, and January, 1885.)

"Warnings during January were of extraordinary value to the merchants, railroads, and farmers in this section of the country. Many inquiries were made by merchants and at the exchanges and much valuable information was given." (Form 112b, January, 1885.)

"The warnings are of special benefit to gardeners, roofers, dealers in oysters, fruit, and vegetables, farmers, ice-packers, railroads, and dealers in live stock." (Forms 112b, November and December, 1884, and February, 1885.)

Washington, D. C.: Warnings are telegraphed over the lines of the following railroads viz: Baltimore and Potomac; Alexandria and Fredericksburg; Pope's Creek; Washington, Ohio and Western; Chesapeake and Ohio; and Virginia Midland; also over the telegraph lines of the Chesapeake and Ohio Canal Company. The Chesapeake and Potomac Telephone Company send all cold-wave messages over their lines to Frederick, Hagerstown, Westminster, and Baltimore, and from these cities to all connecting points in Fred-

erick, Carroll, and Baltimore Counties. Whenever cold waves are expected to occur in the sections traversed by the Baltimore and Ohio Railroad, warnings of their approach are telegraphed to Superintendent Selden, Baltimore; General Superintendent Zeuhlin, Chicago; and Superintendent Leslie, New York City. The following are the States included in this system: New York, New Jersey, Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Indiana, Illinois, and Kentucky. (Letters November 14, November 29, and December 29, 1884.)

Whenever cold-wave signals are ordered for Washington notification of the fact is telegraphed to Messrs. W. S. Meyer & Bro., Westminster, Maryland. (Instructions September 18, 1884.)

The following is a list of the regular Signal Service stations at which the cold-wave signal is displayed:

Name of station.	Established.	Name of station.	Established.
Albany, N. Y.....	Mar. 22, 1884	Leavenworth, Kans.....	July 30, 1884
Atlanta, Ga.....	Nov. 6, 1884	Little Rock, Ark.....	May 17, 1884
Augusta, Ga*.....	Apr. 4, 1885	Logansport, Ind.....	July 30, 1884
Bangor, Me.....	July 30, 1884	Louisville, Ky.....	Dec. 26, 1883
Buffalo, N. Y.....	Mar. 8, 1884	Lynchburg, Va*.....	Apr. 4, 1885
Boston, Mass.....	July 30, 1884	Memphis, Tenn.....	Oct. 17, 1884
Burlington, Iowa.....	July 30, 1884	Milwaukee, Wis.....	Nov. 6, 1884
Baltimore, Md.....	Sept. 20, 1884	Montgomery, Ala.....	Nov. 19, 1884
Chattanooga, Tenn.....	Mar. 21, 1884	Nashville, Tenn.....	Dec. 26, 1883
Chicago, Ill.....	Dec. 26, 1883	New York City, N. Y.....	July 30, 1884
Cincinnati, Ohio.....	Dec. 26, 1883	New Haven, Conn.....	Nov. 6, 1884
Columbus, Ohio.....	July 23, 1884	New London, Conn*.....	Apr. 4, 1885
Concordia, Kans*.....	Apr. 4, 1885	New Orleans, La.....	Nov. 6, 1884
Cleveland, Ohio.....	Nov. 6, 1884	Norfolk, Va*.....	Apr. 4, 1885
Cairo, Ill.....	Nov. 12, 1884	Omaha, Nebr*.....	Apr. 4, 1885
Charlotte, N. C.....	Jan. 27, 1885	Philadelphia, Pa.....	July 30, 1884
Charleston, S. C*.....	Apr. 4, 1885	Pittsburg, Pa.....	July 23, 1884
Des Moines, Iowa.....	July 30, 1884	Portland, Me*.....	Apr. 4, 1885
Detroit, Mich.....	July 30, 1884	Rochester, N. Y.....	Nov. 6, 1884
Davenport, Iowa.....	Nov. 6, 1884	Springfield, Ill.....	July 23, 1884
Denver, Colo*.....	Apr. 4, 1885	Saint Louis, Mo.....	Dec. 26, 1883
Dodge City, Kans*.....	Apr. 4, 1885	Saint Paul, Minn*.....	Apr. 4, 1885
Dubuque, Iowa*.....	Apr. 4, 1885	Shreveport, La.....	Nov. 19, 1884
Greencastle, Ind.....	July 23, 1884	Sandusky, Ohio*.....	Apr. 4, 1885
Galveston, Tex.....	Oct. 17, 1884	Savannah, Ga*.....	Apr. 4, 1885
Grand Haven, Mich*.....	Apr. 4, 1885	Toledo, Ohio.....	Nov. 6, 1884
Indianapolis, Ind.....	July 23, 1884	Vicksburg, Miss*.....	Apr. 4, 1885
Jacksonville, Fla.....	Nov. 6, 1884	Washington, D. C.....	July 30, 1884
Keokuk, Iowa.....	Nov. 6, 1884	Wilmington, N. C*.....	Apr. 4, 1885
Knoxville, Tenn*.....	Apr. 4, 1885		

* To take effect on and after July 1, 1885.

The cold-wave signal is also displayed in the following cities:

Name.	Established.	Name.	Established.
Auburn, Ala.....	Sept. 20, 1884	Richmond, Va.....	June 6, 1885
Kansas City, Mo.....	Feb. 13, 1884	Westminster, Md.....	Sept. 18, 1884
Madison, Wis.....	Feb. 11, 1885		

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,
Washington, D. C.

APPENDIX 55.

REPORT UPON THE WEATHER AND TEMPERATURE SIGNALS.

SIGNAL OFFICE, *Washington, D. C., June 30, 1895.*

SIR: I have the honor to make the following report upon the weather and temperature signals in use by this Service and State weather services:

The Chief Signal Officer being very frequently called upon by persons interested in weather and temperature changes, who have no means of obtaining the information, to furnish them the indications for the ensuing twenty-four hours, a plan has been adopted by which, through the co-operation of a number of railroads, the State weather services of Alabama and Ohio, and the citizens of certain towns, the indications of the weather and temperature for specific localities are given the public in the form of signals that are displayed on railway trains, at railway stations, and on flag-staffs erected in small towns.

The following is the list of weather and temperature signals adopted and in use by the Signal Service:



No. 1.—Large red sun, indicates "higher temperature" or warmer weather.



No. 2.—Red crescent, indicates "lower temperature" or colder weather.



No. 3.—Red star, indicates "stationary temperature."



No. 4.—Large blue sun, indicates "general rain (or snow)."



No. 5.—Blue crescent, indicates "clear or fair weather."



No. 6.—Blue star, indicates "local rain (or snow)."

These signals are used in two forms, the first being six flags, not less than 6 feet square, having the symbols in the center on white ground; and the second consisting of sheet-iron plates, about 3 feet in diameter, on which are painted the colors that denote the

signals. The flags are displayed from staffs erected at railway stations, in cities, small towns, &c., and the sheet-iron plates are attached to railway trains.

The system of signals above described is also in use by the Ohio State weather service.

The Alabama State weather service has adopted a different system of flag signals for use in that State, but the weather and temperature indications which these signals denote are almost identical with the Signal Service and Ohio State weather service system.

There are prepared at this office each night special forecasts of the weather for the succeeding twenty-four hours for the States of Alabama and Ohio, and for the regions traversed by railroads that have adopted this system of signals.

These special forecasts are telegraphed from this office to the directors of the Alabama and Ohio State weather services, to General J. F. Boyd, superintendent Cumberland Valley Railroad, to the superintendent of the Frederick division of the Pennsylvania Railroad, and others hereinafter mentioned.

The secretary of the New England Meteorological Society, at Cambridge, Mass., receives the indications from the Signal Service observer at Boston, Mass., to whom they are sent by this office.

Upon the receipt of the indications sent out by this office, the directors of the Alabama and Ohio State weather services and of the New England weather service immediately telegraph them to the superintendents of the various railway companies in their respective States that co-operate in the display of these signals.

The superintendents promptly distribute the information along their lines, and the signals which indicate the coming weather changes are displayed at an early hour, either at the railway stations or from railway trains.

Farmers, merchants, and the public generally along the lines of the railroads are informed by means of these signals as to the weather probabilities for the day, and they are thus enabled to take such precautions and to make such arrangements as the weather indications suggest are for their interest.

The superintendent of the Cumberland Valley Railroad and the superintendent of the Frederick division of the Pennsylvania Railroad receive the indications soon after midnight. The morning trains on these lines carry the proper symbols displayed on the baggage cars.

During the year this Service has endeavored to extend the system of weather and temperature signals, and all means that were available have been used to attain this result; but, owing to the fact that no appropriations have been made for the purpose, efforts in this direction have been greatly crippled, and this office has been unable to furnish the necessary signal flags to indicate probable weather conditions.

On May 14, 1885, 10,000 circulars were printed. A full description of each flag signal, with colored illustration, was given; also the price at which the full set of signals could be obtained, and the names and addresses of the manufacturers who would furnish them.

These circulars have been widely distributed among those who are interested in and receive benefit from weather predictions, and they have been informed that, as the weather indications are telegraphed daily to a large number of the stations of this service, to railroads, post-offices, &c., there are many small towns which could, by proper arrangement, obtain them by telephone or otherwise from the Signal Service stations, railroad stations, or post-offices receiving the reports and displaying the flags; also that the system is now in successful operation at various places, and could, by a little exertion and a small outlay for flags on the part of those who would be benefited, be extended indefinitely, and become one of the most valuable aids to the farmer, the merchant, and the public generally.

Correspondence has also been held with a number of railroad companies with a view to establishing this system on their lines.

It is gratifying to state that the efforts in this direction have met with considerable success, as will be shown in the following outline of what has been accomplished:

This system of signals has been adopted by the Florida Railroad and Navigation Company, and the disks showing the proper signals will be displayed from the baggage cars, beginning July 1, 1885. This company operates 540 miles of railroad and several steamers in Florida. The observer at Jacksonville will superintend the display of signals and take measures to have them properly understood. The special indications for Northern Florida are sent from this office at 1 a. m. daily.

The flag system of signals has been adopted by the Board of Trade of Albany, N. Y. The flags are displayed daily, from a staff on the signal office, and give the greatest satisfaction to the public.

The "Albany and New York day line of steamers" display the flag signals on their boats from Albany south to Poughkeepsie, and from New York City north to Poughkeepsie. The special 1 a. m. indications for Albany and vicinity and for New York and vicinity are furnished daily to this line of steamers by the observers at Albany and New York.

At Troy, N. Y., Messrs. E. W. Boughton & Co. display the flag signals at the expense of the firm. Special indications for Albany and vicinity are sent by telephone from the signal office at Albany.

In letter of June 8, 1885, Mr. W. A. Graham, of Fort Gaines, Ga., states that he will have no trouble in providing flags for display of signals at Fort Gaines if the indications are telegraphed daily. Mr. Graham was informed that as soon as he purchases the necessary flags the indications will be sent.

Mr. Frank Ross, at Oil City, Pa., states, in letter of June 5, 1885, that he can procure the funds to purchase flags for display at Oil City; and requests that the observer at Pittsburgh be authorized to telegraph the indications daily for that section. He was told that this will be done when he reports that he has the flags.

At Meadville, Pa., the signals are displayed daily by Mr. J. W. H. Reisinger, postmaster. Special indications for Meadville, Pa., and vicinity are telegraphed from this office to Mr. Reisinger at 1 a. m. daily.

In letter of May 14, 1885, Mr. C. Selden, superintendent Baltimore and Ohio Telegraph Company, asks whether the Signal Service will furnish sets of weather and temperature signal flags for display at the principal points and important branch offices of the Baltimore and Ohio Railroad. If the service desires to do this, Mr. Selden thinks he can arrange with the president and general manager to have the signals displayed daily at such offices.

Mr. Selden was informed that this service has not the necessary funds from which to purchase flags, but they can be procured if the Baltimore and Ohio Railroad Company will co-operate by sending the telegrams and furnishing transportation for an observer to visit stations along the line of the road for the purpose of inducing the citizens to purchase the flags. Should this be done weather warnings will be made a special feature of the road, and special forecasts for each State will be made at this office.

Final arrangements have not yet been perfected.

The observer at Toledo, Ohio, in letter of May 28, 1885, states that the Toledo, Cincinnati and Saint Louis, and the Ohio Central Railroads will display the signals.

Special 1 a. m. indications for the vicinity of the Toledo, Cincinnati and Saint Louis Railroad, in Northern Ohio and Eastern Indiana, are telegraphed daily to Mr. N. McKinnon, superintendent of telegraph at Toledo.

Special 1 a. m. indications for the vicinity of this road in Central Illinois and Western Indiana are telegraphed daily to Mr. H. A. Boomer, division superintendent, Charleston, Ill.

Mr. McKinnon states that the messages will be sent to the towns along the road, and if this is not satisfactory, signals will be displayed on the trains.

The observer at Toledo also reports, in letter of June 24, 1885, that the officials of the Ann Arbor and Northern Michigan Railroad have promised to display the signals on their trains as soon as the road is completed to Mount Pleasant, Mich., which will be in a month or two.

U The observer at Shreveport, La., in letter of June 20, 1885, states that the merchants are deeply interested in the subject of weather and temperature signals, and intend purchasing a set of flags for display on the signal office flag-staff.

The observer at Leavenworth, Kans., in letter of June 20, 1885, states that the display of signals on the Kansas Central Railway began June 20, 1885. The adoption of this system of signals by this road is due to the perseverance and energy of Dr. R. J. Brown, chairman of the meteorological committee of the Leavenworth Board of Trade, and to the efforts of the observer. Flags cannot be used to advantage, owing to the obstructions offered by two bridges, and the superintendent of the road has had an ornamental and well-arranged set of disks painted on white surfaces of steel, to be fixed in grooved slats placed on each side of the baggage-cars. Trains displaying these signals run between Leavenworth and Miltonville, a distance of 166 miles, and decided interest is manifested in them by the public.

Special indications for Kansas, Indian Territory, and Western Missouri are sent daily at 1 a. m. to the observer at Leavenworth, Kans.

The observer at Indianapolis, Ind., in letter of April 27, 1885, reports that Mr. Joseph W. Sherwood, superintendent Cincinnati, Indianapolis, Saint Louis and Chicago Railroad, desires to display signals on his trains as soon as arrangements can be made. The observer was informed as to the kind of signals to use, and directed to notify Mr. Sherwood that special predictions for the region of his road will be sent him if he adopts the system.

Weather and temperature signals are displayed daily at Bristol, R. I., and at Watertown, N. Y., by interested persons.

In letter of June 25, 1885, the observer at Toledo, Ohio, forwarded a communication from Mr. T. M. Peelar, superintendent Ohio Central Railroad, requesting that the 1 a. m. indications be sent him. Mr. Peelar was informed that a telegram designating the proper

flags to be displayed at stations on the Ohio Central Railroad will be sent him at Bucyrus, Ohio, at 1 a. m. daily. He was also sent circulars to be used in translating messages, if he desires only to bulletin the indications at stations on the line.

It is apparent that this method of announcing weather changes has been received with great favor by the public, and that the information given is of value to a large number of persons. This is abundantly shown by the hearty indorsement that the system has met with wherever it has been introduced.

It is hoped that these signals will, in the near future, be displayed in many towns where the residents have no means at present of obtaining information as to probable weather changes.

The simplicity and utility of the system cannot fail to commend it to every person who realizes the importance of a foreknowledge of the weather.

It is only necessary that the signal flags be purchased (the cost of the entire set ranging from \$16 to \$21) and that some public-spirited citizen devote a few minutes' time each day to displaying the proper signal, or signals, on a flag-staff in a prominent position near the center of the town. The indications for the locality can be sent from this office each day at a cost of 20 cents, or they can possibly be received from a neighboring Signal-Service station, or railway station, by telephone or telegraph. By these means an entire community can be benefited at a very small outlay.

The co-operation of a greater number of railroads is also desired, as it has been found that the display of these signals from railway trains and at railway stations has been productive of the best results.

The following is quoted from an interesting article on the Ohio meteorological bureau, written by Prof. T. C. Mendenhall, director of the Ohio State weather service, and published in the *American Meteorological Journal*, May, 1884:

"One of the most important undertakings of the bureau has been the establishment of a system of railway signals, by means of which people in the neighborhood of a railway line could be notified of the weather probabilities of the day in accordance with the predictions received from Washington. The first report issued by the bureau contained a reference to the proposed scheme, which had been suggested by Mr. M. R. Tracy, of Litchie, Ohio.

"In the spring of 1883 one of the railroads connecting Columbus with Cleveland (the Cleveland, Mount Vernon and Delaware Railroad) consented to undertake the experiment, offering to bear the expenses necessary in equipping the cars with the necessary signals. The subject of the most suitable system of signals received careful consideration. It was important that those selected should be at once simple, easily interpreted, and of such character as to be readily distinguished at a considerable distance. It was determined to confine the predictions, for the present at least, to forecasts of temperature and the state of the weather as to precipitation. Three forms were chosen, called by the familiar names sun, moon, and star. These are shown in two colors, red and blue. The red signals refer to temperature and the blue to rainfall. The sun, a round disk nearly 3 feet in diameter, is understood to mean a probable rise in temperature if red, or a general rain if blue. The moon, a crescent, means falling temperature if red, and clear or fair weather if blue. The star, five-pointed, means stationary temperature if red, and local rains if blue.

"Experience has shown that these signals are admirably adapted to the service to which they have been put, being easily distinguished from each other and instantly interpreted after a little practice.

"The Chief of the United States Signal Service, General Hazen, has generously co-operated with the bureau to secure the success of the experiment. Special telegrams have been sent, using the language of the signals, for the region of country traversed by the road. The trains bearing these signals on the baggage cars leave a point near the middle of the line about 5 o'clock a. m., thus bringing the forecast to the attention of residents along the line at an early hour. Verification observers have been appointed at nearly every station along the route, and thus far the predictions have been found correct in 85 cases in 100. The want of one or two additional signals has been felt for occasional use in forecasting extraordinary changes, such as extreme cold, violent winds, &c. The matter is receiving consideration, but no selection of such signals has been made. The Bureau has furnished models of these signals to several persons interested in this work who are making efforts to have them placed on roads in other States, and it is intended to extend the system in Ohio during the present year (1884)."

In connection with my report on this subject I have the honor to submit also the reports made by Prof. P. H. Mell, jr., director of the Alabama State weather service, Mr. E. H. Mark, secretary Ohio meteorological bureau, and Prof. William M. Davis, secretary New England Meteorological Society.

These reports are of special interest, as they indicate the importance attached to weather predictions in Alabama, Ohio, and New England, and also show the extent to

which the use of the weather and temperature signals has been carried in these sections through the generous co-operation of railway officials and others:

OHIO METEOROLOGICAL BUREAU,
Columbus, Ohio, June 8, 1885.

DEAR SIR: In reply to yours of the 6th instant, I have the honor to inform you that the railway weather signals are displayed on the Cleveland, Mount Vernon and Delaware, both divisions of the Columbus, Hocking Valley and Toledo, and the Columbus and Cincinnati Midland Railroads. This bureau has charge of all the signals, and keeps a man employed at the Union Depot in Columbus to change the signals on all trains carrying them. The signals are also displayed on the morning trains coming into Columbus.

The predictions are received here in Columbus at about 1 a. m., and are immediately transmitted to the night operator at the telephone office, who transmits them to the telegraph offices at the depot. The night operator also transmits them to the train dispatcher of each of the roads, who immediately telegraphs them to the other end of the road, so that the morning train leaving for Columbus displays the signals. The signals are changed at these points by the baggage-master. On the Cleveland, Mount Vernon and Delaware the telegram containing the signals is sent to Akron, the central office of the road. The superintendent then issues an order to his trainmen in the same manner that all other train orders are issued.

The superintendent of the Cleveland, Mount Vernon and Delaware Railroad is N. Monarrat, Akron, Ohio. The superintendent of the Columbus, Hocking Valley and Toledo Railroad is G. R. Carr, Columbus, Ohio. The superintendent of the Columbus and Cincinnati Midland Railroad is S. P. Peabody, Columbus, Ohio. The first two named gentlemen have taken great interest in the work, and have done all they could to assist the bureau in carrying on the work.

The number of stations on the Columbus, Hocking Valley and Toledo is about one hundred; on the Cleveland, Mount Vernon and Delaware, thirty-seven; on the Columbus and Cincinnati Midland, thirty.

In addition to the above, many towns display the signals in prominent places, and quite an interest has been worked up in some places. Applications are received frequently from towns not lying on the railroads displaying the signals asking for the signals in their locality. Some of the agricultural societies of the State are anxious to take hold of the system, but the bureau is not able financially to extend the work.

Those sections receiving the signals place great reliance on the predictions as sent out by the Chief Signal Office. The large percentage of verification makes it a reliable source of information.

Hoping that the work may be greatly extended and ready to give any further information that you may desire,

I am, very respectfully, your obedient servant,

E. H. MARK, *Secretary.*

General W. B. HAZEN,
Chief Signal Officer, Washington, D. C.

[State Agricultural and Mechanical College, Department of Natural History and Geology, and Central Office State Weather Service.]

AUBURN, ALA., June 16, 1885.

DEAR SIR: I have the honor to acknowledge the receipt of yours of the 6th instant, and send inclosed a list of the railroads displaying signals, their superintendents, the men having charge of the weather service on these various roads, and the stations at which these signals are displayed.

* The superintendents of all the roads have taken the matter under their immediate charge, except the Mobile and Montgomery Railroad, the Mobile and Girard Railroad, and the Western Railroad of Alabama.

The weather service on the first two of these roads is under the direction of the chief telegraph railroad operators, while on the last-named road I authorize the operators at the stations to appropriate the message you furnish me each day, which they catch as it passes over the wires. This road has no wires of its own, and the Western Union Telegraph Company will not let the railroad authorities send these telegrams without charge.

The weather indications are received at this office between 6 and 7 o'clock, and are the indications issued from your office at 1 a. m.

The East Tennessee, Virginia and Georgia Railroad does not own its telegraph lines, and the only way to display signals along that road, I found, was to display them from the trains. The schedule on this road enables the signals to reach all parts of the road

before 3 p. m. I hope soon to have the signals displayed from the trains on the following roads, viz: The Alabama Great Southern Railroad, the Montgomery and Eufaula Railroad, the Memphis and Charleston Railroad, the Columbus and Western Railroad.

These roads do not own their telegraph lines, and hence the only way to reach the territory is by displaying the signals from the trains for the present.

The following are the railroads, with number of stations on each, that receive the weather signals daily:

Name of railroad.	Superintendents.	Number of stations.	Remarks.
Atlanta and West Point and Western of Alabama.	Cecil Gabbett, Montgomery, Ala.	12	The stations on this road are not furnished by the railroad superintendent, but directly from Auburn, Ala.
South and North.....	I. Y. Sage, Birmingham, Ala.....	9	Signals are furnished for these stations to Mr. W. Haylow, Montgomery, Ala.
Mobile and Montgomery..	M. S. Belknap, Montgomery, Ala.	3	
Mobile and Girard.....	W. L. Clarke, Columbus, Ga.....	5	Signals are furnished these stations through Mr. J. A. Roland, railroad telegraph operator, Columbus, Ga.
The Georgia Pacific	Levi Hege, Birmingham, Ala.....	11	
East Tennessee, Virginia and Georgia (Alabama Division).	J. M. Bridges, Selma, Ala.....	64	
North Eastern, of Georgia.	H. R. Bernard, Athens, Ga.....	8	

I am, very respectfully,

P. H. MELL, Jr.,

Director Alabama Weather Service.

The CHIEF SIGNAL OFFICER, *Washington, D. C.*

NEW ENGLAND METEOROLOGICAL SOCIETY,
CAMBRIDGE, MASS., *July 9, 1885.*

CHIEF SIGNAL OFFICER, UNITED STATES ARMY,
Washington, D. C.:

SIR: In reply to your letter of the 6th ultimo, I have the honor to send, inclosed, a list of stations in New England, excepting Connecticut, displaying cold-wave and other weather signals.

The 1 a. m. indications are sent by mail from the Boston Signal Office to the following telephone exchanges:

Haverhill, Lowell, Salem, South Framingham, and Worcester, Mass.; also to G. S. Bass, assistant postmaster, Quincy, Mass. The morning mail reaches these points in time for an early display of flags.

The same indications are telegraphed from Signal Office in Boston to W. H. Childs, Brattleborough, Vt.; Telephone Exchange, Manchester, N. H., and from Signal Office in New Haven, Conn., to Telephone Exchange, Springfield, Mass.

It is from these centers that we hope to display flags and to extend the display to adjoining towns.

* * * * *

Where the flags are displayed they are reported to give much satisfaction.

Stations displaying weather flags in New Hampshire, Vermont, Massachusetts, and Rhode Island.

Station.	Number of flags displayed.	Indications used.	Display begun.	Indications furnished by—	Flags furnished by—	Displayed by—
Bedford, Mass.	Set of seven.	1 and 7 a. m.	Feb. —, 1885	Boston Telephone Exchange	Old Colony R. R.	Police Department.
Boston, Mass.	Cold wave.	do.	Jan. 20, 1885	Signal Office	W. H. Childs.	Old Colony R. R.
Bracebridge, Vt.	Set of seven.	1 a. m.	Feb. 12, 1885	Telephone from Boston signal office	Old Colony R. R.	W. H. Childs.
Brockton, Mass.	Cold wave.	Special	Jan. 20, 1885	Boston Telephone Exchange	T. Owen.	Old Colony R. R.
Canton, Mass.	Set of seven.	1 and 7 a. m.	Feb. 26, 1885	Worcester Telephone Exchange	do.	do.
Clinton, Mass.	do.	1 a. m.	Now ready	do.	do.	do.
Cochituate, Mass.	do.	do.	do.	do.	do.	do.
Dedham, Mass.	do.	1 and 7 a. m.	Jan. —, 1885	Franklinham Telephone Exchange	Geo. C. Fairbanks.	Town clerk.
East Pepperell, Mass.	do.	1 a. m.	Mar. 20, 1885	Worcester Telephone Exchange	H. H. McQuillan.	Cochituate Enterprise.
Fall River, Mass.	Cold wave.	Special	Jan. 20, 1885	Franklinham Telephone Exchange	G. G. Tatchell.	Police Department.
Fitchburg, Mass.	Set of seven.	1 a. m.	Now ready	Worcester and Nashua R. R.	Old Colony R. R.	Old Colony R. R.
Fitchburg, Mass.	do.	do.	May —, 1885	do.	J. W. Kimball.	Old Colony R. R.
Hanover, N. H.	do.	1 and 7 a. m.	Jan. 26, 1885	Fitchburg Telephone Exchange	Wickok & Frost.	Wickok & Frost.
Highland Centre, Mass.	do.	do.	Apr. —, 1885	Old Colony R. R.	C. S. Cook.	C. S. Cook.
Leicester, Mass.	Cold wave.	1 a. m.	Feb. 4, 1885	Providence and Worcester R. R.	J. B. Sprague.	J. B. Sprague.
Leominster, Mass.	Set of seven.	7 a. m.	Feb. —, 1885	Old Colony R. R.	T. A. Hill.	T. A. Hill.
Manchester, N. H. (a)	do.	1 a. m.	Feb. —, 1885	Manchester Telephone Exchange	A. O. Gage.	City Government.
Manchester, N. H. (b)	do.	do.	May —, 1885	do.	McQuade Bros.	McQuade Bros.
Marlborough, Mass.	do.	do.	Mar. —, 1885	Old Colony R. R.	Pratt Bros.	do.
Medford, Mass.	Cold wave.	1 and 7 a. m.	Jan. 20, 1885	Boston Telephone Exchange	Old Colony R. R.	Police department.
Middleborough, Mass.	Set of seven.	Special	Feb. 18, 1885	Old Colony R. R.	J. W. Crosby.	Old Colony R. R.
Milford, N. H.	do.	1 a. m.	June 18, 1885	Boston and Lowell R. R.	George C. Finkhanks.	J. W. Crosby.
Natick, Mass.	do.	do.	Jan. 20, 1885	Franklinham Telephone Exchange	Old Colony R. R.	Old Colony R. R.
New Bedford, Mass.	Cold wave.	Special	Jan. 20, 1885	do.	do.	do.
Newport, R. I.	Set of seven.	1 and 7 a. m.	Jan. 20, 1885	Boston Telephone Exchange	Improvement Association.	J. R. Orcutt.
North Weymouth, Mass.	do.	do.	do.	do.	do.	do.
Pawtucket, R. I. *	do.	1 a. m.	May —, 1885	Providence and Worcester R. R.	do.	H. F. Jenks.
Pittsfield, Mass.	do.	do.	Jan. 20, 1885	Housatonic R. R.	J. R. Harrison.	J. R. Harrison.
Plymouth, Mass.	Cold wave.	Special	Jan. 20, 1885	Old Colony R. R.	Old Colony R. R.	Old Colony R. R.
Quincy, Mass. (a)	do.	do.	do.	do.	do.	do.
Quincy, Mass. (b)	Set of seven.	1 and 7 a. m.	Apr. 1, 1885	Boston Signal Office and Old Colony R. R.	G. S. Bus.	G. S. Bus.
Rock Bottom, Mass.	Cold wave.	1 a. m.	Apr. 4, 1885	do.	J. F. O'Brien.	J. F. O'Brien.
Somerset, Mass.	do.	Special	Jan. 20, 1885	Old Colony R. R.	Old Colony R. R.	Old Colony R. R.
South Braintree, Mass.	do.	do.	do.	do.	do.	do.
South Weymouth, Mass.	Set of seven.	1 and 7 a. m.	Mar. 1, 1885	Boston Telephone Exchange	Improvement Association.	H. A. Thomas.
Springfield, Mass. *	do.	do.	do.	do.	do.	do.
Taunton, Mass. (a)	do.	1 a. m.	Feb. 17, 1885	Standard Time Company	Rabbitt & Chapin.	City of Taunton.
Taunton, Mass. (b)	do.	1 and 7 a. m.	Mar. 5, 1885	Old Colony R. R.	City of Taunton.	Chief of police.
Taunton, Mass. (c)	Cold wave.	do.	Jan. 20, 1885	do.	E. U. Jones.	do.
Walham, Mass.	Set of seven.	Special	Mar. 20, 1885	Boston Telephone Exchange	do.	do.
West Medford, Mass.	do.	1 and 7 a. m.	Mar. 16, 1885	do.	Bradford & Williams.	Bradford & Williams.
West Medford, Mass.	do.	do.	do.	do.	Subscription.	F. H. Walker.

* In preparation.

Very respectfully, your obedient servant,

W. M. DAVIS,
Secretary New England Meteorological Society.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,
Washington, D. C.

APPENDIX 56.

REPORT ON RAILWAY WEATHER BULLETIN SERVICE.

SIGNAL OFFICE,

Washington, D. C., June 30, 1885.

SIR: I have the honor to make the following report upon the work done by this service in connection with the Railway Weather Bulletin Service during the year ending June 30, 1885:

In arranging for railway bulletins of weather reports, the following points are observed:

This office causes the indications to be furnished at a fixed hour to any railway company volunteering to transmit them over their lines without charge to the United States.

The bulletins are displayed upon bulletin boards, having a heading as follows: "Daily weather report, Signal Service, United States Army. Published by co-operation of the _____ Railway Company and posted for the benefit of agriculture, commerce, and the traveling public."

Each station is supplied by this office with the following articles: One bulletin-board, one district map, one district map frame, Forms 125a (monthly report), Forms 126 (railway bulletins), franked envelopes.

The superintendents of the railway companies have the indications telegraphed to all the offices on their roads at as early an hour as practicable after they are open for business, and a copy of the indications, plainly written upon the "railway bulletin," is posted without delay upon the bulletin-board at each railway station.

The time of receiving and time of displaying the indications are noted by the operator on Form 125a, which form is forwarded to this office by mail at the end of each month by the operator or manager in charge of the telegraph office at which the indications are received, and a retained copy is kept for reference. Four of the bulletins displayed at the station are forwarded to this office by mail with Form 125a, one bulletin for each week included in the report.

Observers in charge of Signal Service stations from which the indications and weather reports are distributed give special attention to this portion of their duties. They see that the reports are furnished to the operator or designated agents of the companies immediately upon their receipt from this office.

They also confer with the officers of the railway companies at their stations and explain that the object of the railway bulletin service is to distribute the information collected at this office, and that the reports may prove of value to the railroads, the traveling public, and to citizens on the lines of the roads.

The railway bulletin system of weather reports is a most valuable adjunct of the Signal Service. Through the co-operation of the many railroad companies that have generously extended their aid without expense to the United States, the indications are daily posted at hundreds of towns, villages, and stations throughout the country, and thus thousands of persons are kept fully informed as to the conditions of the weather and the indications for the succeeding twenty-four hours. These small places on the lines of railroads have no newspapers, and many of them being at a great distance from the principal cities, the large number of people who are interested in and benefited by the weather reports have no means of obtaining the information except through the telegraph offices of the railway companies. It will be readily seen, therefore, that the farmers, fruit-growers, shippers of merchandise, lumbermen, and persons engaged in other industries who are dependent upon this system of publishing the weather reports are deeply interested in its support and extension.

The following extracts from the reports of the inspectors of the railway bulletin service indicate the importance attached to the work done by the Signal Service in this matter:

[From report of the inspection of the weather bulletins posted on the Cincinnati, Washington and Baltimore Railroad, by Sergt. L. Dunne, December, 1884.]

"With a few exceptions I found the indications for the day on which my visit was made, posted on the bulletin-boards. No bureau of the Government is more appreci-

ated than the Signal Service. Although my final instructions of November 25, 1884, did not mention post-offices, yet I made it a point to visit those displaying 'Farmers' Bulletins.' I found the bulletins were promptly posted. Postmasters say that hardly a person enters the office without consulting the bulletin. All speak in flattering terms of the great success attained in weather forecasts. The weather warnings are closely watched."

[From report of stations inspected on the Cleveland, Columbus, Cincinnati and Indianapolis Railroad, by Sergt. William Line, December 13, 1884.]

"The people along the various divisions take great interest in this work, and the indications are of great value to them, I am positive, for during the trip I had an opportunity to see the people and consult them."

[From report of stations inspected on the Flint and Pere Marquette Railroad, by Sergt. N. B. Conger, December 18, 1884.]

"I found the reports posted promptly. They were up to date, and are considered of great value by the railroad company and the citizens of the several towns where they are posted, and the service can be congratulated upon this evident display of interest in the weather reports."

[From report of stations inspected on the Chicago and West Michigan, and Grand Rapids and Indiana Railroads, by Sergt. J. E. Mueller, January 19, 1885.]

"The stations of Newaygo, Kent City, and Sparta Centre are all flourishing lumber towns, and near the southern terminus of the Newaygo branch of the Chicago and West Michigan Railroad; the country abounds in prosperous farms and fruit orchards, the owners of which are greatly interested in the daily bulletins, and derive considerable benefit from their regular display. The agent at Sparta Centre stated that on various occasions when, by accident or want of time, the indications were missed the people would promptly request him to call up the sending station and get them for their information. 'You see from that,' he continued, 'that it would not do here to neglect these reports, for they have taken too strong a foothold in this section of country.' The interest manifested in the reports is gratifying."

[From report of stations inspected on the Allegheny Valley, the Pittsburg, Fort Wayne and Chicago, and the Bellaire, Zanesville, and Cincinnati Railroads, by Sergt. O. D. Stewart, February 17, 1885. Number of stations inspected 117.]

"The general managers and superintendents of telegraph of each of the above-mentioned roads take great interest in these reports, and they not only desire but direct their agents and operators to copy the indications regularly, to give the public every facility to consult them, and to do all they can to aid in their promulgation. The railway bulletin is an important work of the service, as it reaches points too remote to be supplied in any other manner. My tour of inspection included portions of the States of Pennsylvania, Ohio, Indiana, and Illinois. I found the interest varied in different localities, depending largely upon the prevailing occupations of the people, but increasing in all localities. In Ohio a more general interest is manifested than in the other States mentioned. Many of the railroads running through that State carry the railway signals on sides of the baggage cars. These signals are regularly looked for and noted."

"All towns having a population of from 2,000 to 7,000 should receive the indications regularly, and especially have all the cold-wave orders telegraphed to them. In towns of this size there are enough persons sufficiently interested to bear, should it be necessary, the cost of transmitting the warnings."

[From report of stations inspected on the New York and New England Railroad, by Private J. P. Slaughter, February 27, 1885.]

"Much interest is manifested in predictions at nearly all stations. A large number of persons, both travelers and residents along the road, daily consult these bulletins, and are frequently much benefited by them."

During the year ending June 30, 1885, the railway weather bulletin service has been established on the following-named roads:

Name of railroad.	Number of stations posting the indications.	Name of railroad.	Number of stations posting the indications.
Bellaire, Zanesville and Cincinnati.....	9	South Carolina.....	10
Ohio River.....	9	Charleston and Savannah.....	6
Saint Louis and Cairo.....	12	Richmond and Alleghany.....	22
Washington, Ohio and Western.....	7	North-Eastern.....	5
Chicago and Alton.....	15	Saint Louis, Iron Mountain and South-ern.....	20
Cleveland, Lorain and Wheeling.....	7		

The stations posting the indications on the railroads mentioned in the following list have been inspected during the year: .

Name of railroad.	Number of stations inspected.	Name of inspector.
New York Central and Hudson River.....	20	Sergt. J. O. Barnes.
Baltimore and Ohio.....	71	Sergt. Geo. W. Felger.
Boston and Lowell.....	13	Sergt. O. B. Cole.
Worcester, Nashua and Rochester.....	18	Do.
New York and New England.....	45	Private J. P. Slaughter.
Old Colony.....	108	Private O. N. Oswell.
Providence and Worcester.....	13	Sergt. O. B. Cole.
Burlington, Cedar Rapids and Northern.....	98	Sergt. P. F. Lyons.
Chicago and Northwestern.....	56	Sergt. T. B. Jennings.
Marietta and Cincinnati.....	14	Sergt. L. Dunnc.
Cleveland, Columbus, Cincinnati and Indianapolis.....	33	Sergt. William Line.
Grand Rapids and Indiana.....	81	{Sergt. J. E. Mueller. Private S. R. Richey.
Chicago and West Michigan.....	40	{Sergt. J. E. Mueller. Private S. R. Richey.
Detroit, Grand Haven and Milwaukee.....	4	Sergt. N. B. Conger.
Flint and Pere Marquette.....	14	Do.
Detroit, Lansing and Northern.....	21	Do.
New York, Ontario and Western.....	81	Sergt. J. G. Linsley.
Southern Central.....	22	Do.
Allegheny Valley.....	38	Sergt. O. D. Stewart.
Pittsburg, Fort Wayne and Chicago.....	66	Do.
Bellaire, Zanesville and Cincinnati.....	13	Do.
Eastern.....	51	Sergt. G. Liebmann.
Grand Trunk (Yarmouth to Island Pond).....	14	Private B. A. Kinney.
Maine Central.....	11	Do.
Portland and Ogdensburg.....	12	Sergt. G. Liebmann.
Atholston, Topeka and Santa Fe.....	89	Private E. M. Philbaum.
Kansas City, Saint Joseph and Council Bluffs.....	45	Corpl. G. A. Weber.
Philadelphia, Wilmington and Baltimore.....	37	Sergt. C. N. Kitchel.
Philadelphia and Reading.....	119	Do.
Northern Central.....	4	Do.
Philadelphia and Erie.....	26	Do.
United Railroads of New Jersey.....	53	Do.
West Jersey.....	35	Do.
Baltimore and Potomac.....	4	Do.
Huntingdon and Broad Top Mountain.....	8	Do.
Cumberland Valley.....	10	Do.
Memphis and Charleston Division East Tennessee, Virginia and Georgia.....	7	Sergt. D. T. Flannery.
Pennsylvania.....	76	Sergt. C. N. Kitchel.

The total number of railway bulletin stations inspected during the year is 1,469.

In addition to those given in the above lists, the following railroads also post the weather bulletins: Boston and Maine, 34 stations; Lehigh Valley, 30 stations; Louisville and Nashville, 20 stations.

The stations on the above-named roads were not inspected this year.

The railway bulletin service was discontinued on the Chicago, Saint Paul, Minneapolis and Omaha Railway October 9, 1884, and on the Burlington, Cedar Rapids and Northern Railway February 25, 1885.

There are fifty-one railroads co-operating with the Signal Service in this important work, and the indications are posted at 1,555 stations along the lines of these roads.

Assuming that upon an average there are twenty-five persons at each of these railway stations who are directly interested in the weather indications, it will be seen that at the total of 1,555 stations there are 38,875 people who are daily benefited by this system of weather reports.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,
Washington, D. C.

APPENDIX 57.

REPORT ON RIVER AND FLOOD WARNINGS.

SIGNAL OFFICE,

Washington City, June 30, 1885.

SIR: I have the honor to state that the river and flood reports from regular Signal Service and special river stations have been continued throughout the year ending June 30, 1885, as in previous years.

The river system of the United States embraces some of the largest navigable rivers of the world, and the area of country drained by them includes great and fertile tracts of agricultural and mineral lands.

The enormous products of the soil and mines have so stimulated the river commerce that millions of dollars are invested in levees, wharves, dams, shipping, &c.

The frequent disasters to these investments by storms and floods, and the destruction of property resulting from the sudden and unforecasted rises of the rivers, have created a demand for such information as can be used to assist the property owners and the public generally in anticipating the future rise of the rivers to the danger line.

In the absence of storms and floods the interests of the river commerce also demand a knowledge of the water supply in the tributaries of our great rivers, to permit a determination of the future supply of water for purposes of navigation at points where the depth is sometimes insufficient. River observations will indicate the slightest increase or decrease of water in the river caused by recent rains, melting of snow, or drought.

The rise or fall of the water at any point will, as a rule, cause a rise or fall farther down the river. To warn those interested who are located below, the observations are immediately telegraphed down the river to such points as experience has shown are most desirable for the warning of river interests.

At points where meteorological stations of the Signal Service are located, the observers of such stations are charged with taking the river observations. At other points where river observations are desired the observers are selected from the citizens at those points.

The duties required of the special river observers consist of taking and recording observations at stated hours of (1) the depth of the water in the river; (2) the state or condition of the weather; (3) the direction of wind; (4) the amount of rain or snowfall since the last observation; (5) the depth of the snow on the ground. These phenomena, if ordered sent by telegraph, are reduced to a brief cipher telegram, as hereinafter described, and delivered to the local telegraph office for transmission to such points as may be directed by the Chief Signal Officer. If ordered sent by mail, they are not enciphered, but entered on the postal cards or other form furnished the river observer, according to the printed headings thereon, and mailed to their destination.

The data collected in making these observations being for the benefit of the public, special river observers are authorized to furnish such data to any one needing the information.

This branch of the service has been largely increased, and a much greater area of country, affected by the changes in our larger rivers, has been covered. The resulting value of the information furnished business interests has been very great.

On January 1, 1885, the special river stations were arranged in sections and placed in charge of the Signal Service observers at section centers.

With a few exceptions, special river observers receive all instructions from, or through, and render all reports and bills to, the section centers. Observers in charge of section centers receive, examine, and certify to the correctness of all reports and bills from special stations, and then forward them to this office.

If reports or bills are not received at the section centers within three days after the period at which they are due, they are called for by mail. Any persistent neglect of the special stations in this direction is reported to the Chief Signal Officer with such recommendation as the observer may consider proper to make to improve the service. Defective reports which cannot be remedied at section centers are sent back to the special stations for correction. Section centers make a report to the Chief Signal Officer, on the 15th day of each month, of the reports which are missing for the previous month, giving the probable reason therefor.

In certifying to bills, care is exercised to see that the time for which charge is made is correct, the vouchers properly signed, &c. Bills are not certified to until the reports which they cover are received and acted upon. Each bill bears the following certificate on its face, signed by the observer in charge of the section center: "The account is correct and just, and the services have been rendered as stated."

Bills are rendered on Form 9 (old Form 62a) and filled out as follows:

"For services rendered as river observer, at ———, for the month of ———, 188—, for ——— (give the number of observations), at ——— cents per day (or observation)."

When an observation or report has been missed or extra ones are taken the fact is noted on the face of the bill, for example: "No observations taken August 2 and 7." The bill is altered to agree with work done.

Observers in charge of section centers are held responsible for the correctness of all bills certified to by them, and they assure themselves of their accuracy before forwarding them to this office. In no case are reports or bills held at section centers longer than is absolutely necessary to act upon them.

In corresponding with special stations, the observers in charge of section centers exercise proper official courtesy and keep a careful record of the correspondence.

The number of observations to be taken daily is determined by the Chief Signal Officer, or by the observers in charge of centers.

The centers are usually located at some important city where the reports of the special stations in the vicinity can be most advantageously collected and published for the benefit of the river commerce.

On November 19, 1884, instructions were issued in pamphlet form for the guidance of river observers in erecting gauges, taking observations, rendering reports, &c.; also a complete cipher for enciphering reports for telegraphic transmission. These instructions cover the entire field of special river observations. They went into effect on the Tennessee River system December 1, 1884, and at all other special river stations January 1, 1885.

On January 1, 1885, the measurement of the depth of water was changed from feet and inches to feet and tenths of a foot, and all measurements have since been so read, recorded, and published.

Regular river observations are made at 2 p. m., seventy-fifth meridian time, daily; but when a rise in the river is sudden or dangerous, or when special reports are called for by the observer in charge of the section center, as many extra observations are taken as are deemed necessary to keep the public fully informed of the nature and extent of the rise.

Form No. 203 is used for enciphering observations. The form properly filled up is delivered at the telegraph office as soon as possible after taking the observations, and the report is immediately telegraphed to the observer in charge of the center. Upon receipt of the reports from the stations in his center the observer in charge transfers his reports from all stations to Form No. 108 (daily report of stage of water in the twenty-four hours ending at 2 p. m., seventy-fifth meridian time). This form gives the following data: Names of stations making reports; height of river above low water; change in twenty-four hours; direction of wind and state of weather at time of report. Copies of this form are posted in conspicuous places so that they are readily accessible to the public. The information is also published in the daily newspapers. By these means all interests are kept fully informed of the condition of the rivers, and are thus enabled to take the necessary precautions for protecting property.

In cases of sudden and dangerous rises, and of floods, the information which is given promptly during the period of danger is of incalculable benefit to rivermen, vessel-owners, shippers of merchandise, &c., and is doubtless often instrumental in saving lives.

Whenever necessary, reports from adjoining stations are ordered sent to observers at special river stations, and are given by them to the press, and also posted in such public places as are most frequented by persons interested in the condition of the river.

All observations taken during the month are recorded on Form No. 114. One copy of this form is retained at the station, and two copies are sent to the observer in charge of the section center.

The observer at Chattanooga, Tenn., in his report upon the operation of the Tennessee flood system during April, 1885, states:

"There is a growing opinion of the value of the system, both in this community and in places lower down the river supplied with daily bulletins from this center. The lumbermen have been so greatly benefited by the reports, that they are anxious to obtain like information of sudden rises, calculated to bring down timber during other months, and a memorial to this effect is being prepared by them, which will be forwarded."

The observer at Nashville, Tenn., in a report dated March 9, 1885, commenting upon a sudden rise in the Cumberland River, states: "Reckoning in money value all property saved during the rise mentioned, it would more than sustain this river-center for

two centuries to come. Also: "The steamboatmen have caused a large bulletin-board, $\frac{1}{4}$ by 6 feet, to be made, at great expense to themselves, whereon is shown daily the river data."

Reports of Western floods were telegraphed during the present season, by special message, to the observer at New Orleans, La., to be by him distributed to the following addresses by messenger, whenever practicable, and to outlying places by telegraph: The Capitolian Advocate, Baton Rouge, La.; W. T. Evans, Vidalia, La.; Thomas Moore, Saint Joseph, La.; M. C. Redmond, Floyd, La.; A. W. Crandall, Tallulah, La.; T. J. Manghan, Rayville, La.; E. M. Coe, Monroe, La.; A. C. McMeans, Bastrop, La.; F. H. G. Taylor, Lake Providence, La.; — Floyd, postmaster, Delta, La.; L. M. Howard, Coushatta, La.; L. C. Giffe, Alexandria, La.; Louisiana Farmer, New Iberia, La.; Dr. J. P. H. Wise, Morgan City, La.; Maj. S. T. Grisamore, editor Thibodeaux Sentinel, Thibodeaux, La.; Sugar Planters' Association, Donaldsonville, La.; Vicksburg Herald, Vicksburg, Miss.; Natchez Democrat, Natchez, Miss.; Dr. Trezevant, Delta, La.; B. Myrick, Girard, La.; Hon. R. C. McCullough, Waterproof, La.; New Orleans Picayune, New Orleans, La.; New Orleans Times-Democrat, New Orleans, La.; The States, New Orleans, La.; New Orleans Daily City Item, New Orleans, La.; New Orleans Bee, New Orleans, La.; The German Gazette, New Orleans, La.; Cotton Exchange, New Orleans, La.; Produce Exchange, New Orleans, La.; Sugar Exchange, New Orleans, La.; Maritime Association, New Orleans, La.; Major Richardson, Chief of State Board of Engineers, New Orleans, La.; W. M. Davidson, Saint Joseph, La.; V. M. Purdy, Lake Providence, La.; Dr. S. S. P. Dangerfield, Delta, La.

The pay of the special river observers is at the rate of 25 cents per observation made, recorded, enciphered, and delivered at the telegraph office. When three or more observations are made in any one day, the pay is at the rate of 75 cents per day.

The following are special rates of pay authorized by this office:

The observer at Eugene City, Oreg., receives 50 cents per observation, or \$1.50 per day when more than three observations are taken in one day. The observer at Harper's Ferry, W. Va., receives 50 cents per observation. The observers at Helena, Ark., and Kansas City, Mo., receive 50 cents per day each. The observer at Muscatine, Iowa, renders his services gratuitously.

The following stations have been discontinued during the year:

Jefferson City, Mo. (Saint Louis Center), March 15, 1885; Lexington, Mo. (Saint Louis Center), March 15, 1885.

The following stations have been established during the year:

Stations.	When established.	Stations.	When established.
Brookville, Pa. (Pittsburg Center).....	Nov. 19, 1884	Coushatta Chute, La. (Shreveport Center).....	Jan. 15, 1885
Clarion, Pa. (Pittsburg Center).....	Nov. 19, 1884	Girard, La. (New Orleans Center).....	Jan. 30, 1885
Johnstown, Pa. (Pittsburg Center).....	Nov. 19, 1884	Delhi, La. (New Orleans Center).....	Jan. 30, 1885
Morgantown, W. Va. (Pittsburg Center).....	Nov. 19, 1884	Beardstown, Ill. (Saint Louis Center).....	Mar. 7, 1885
Parker's Landing, Pa. (Pittsburg Center).....	Nov. 19, 1884	Jerome, Mo. (Saint Louis Center).....	Mar. 7, 1885
Rowlesburg, W. Va. (Pittsburg Center).....	Nov. 19, 1884	Prescott, Wis. (La Crosse Center).....	Mar. 7, 1885
Warren, Pa. (Pittsburg Center).....	Nov. 19, 1884	Wabasha, Minn. (La Crosse Center).....	Mar. 7, 1885
Weston, W. Va. (Pittsburg Center).....	Nov. 19, 1884	Louisiana, Mo. (Saint Louis Center).....	Mar. 7, 1885
Burnside, Ky. (Nashville Center).....	Dec. 1, 1884	Arkansas City, Ark. (Vicksburg Center).....	May 11, 1885
Carthage, Tenn. (Nashville Center).....	Dec. 1, 1884	Bayou Sara, La. (New Orleans Center).....	May 11, 1885
Alexandria, La. (New Orleans Center).....	Jan. 10, 1885	Newport, Ark. (Vicksburg Center).....	May 11, 1885
Fulton, Ark. (Shreveport Center).....	Jan. 10, 1885	Yazoo City, Miss. (Vicksburg Center).....	May 11, 1885
Grand Tower, Ill. (Cairo Center).....	Jan. 15, 1885		

The special river station at Monroe, La., was transferred from the Washington City Center to the New Orleans Center January 30, 1885.

On June 12, 1885, special river stations were ordered to be established at Camden, Ark., and West Melville, La., under New Orleans Center, to date July 1, 1885.

On June 17, 1885, a special river station was ordered to be established at Mount Holly, N. C., under Charleston, S. C., Center, to take effect July 1, 1885.

By special request of the merchants and river captains along the Cumberland River, the special river observations at Burnside, Ky., under Nashville Center, were continued until June 30, 1885.

The following list gives the special river stations now in operation; also the period during which observations are taken, the center to which reports are made, etc.:

Albany, Oreg. (November 15 to December 15, and February 15 to May 1).—Takes ob,

servations daily, and, when the river approaches the danger line, telegraphs reports to Portland, Oreg., consolidated with those of Eugene City, when the latter has been received.

Alexandria, La. (all the year).—Takes observations daily, at 2 p. m., and telegraphs them to Observer, New Orleans, who is also authorized to call for special telegraphic reports. Telegraphs in case of a dangerous rise.

Beardstown, Ill. (all the year).—Takes observations daily, and, when dangerous rise occurs, or when special telegraphic reports are called for, telegraphs them to Saint Louis.

Boonville, Mo. (all the year).—Takes observations daily, and, in case of dangerous rise, or when special reports are called for, telegraphs to Saint Louis. Also telegraphs to Saint Louis in case of ice dams, lumber obstructions, and closing of navigation.

Brookville, Pa. (all the year).—Takes observations daily, at 7 a. m. and 2 p. m., and telegraphs them to Pittsburg in case of dangerous rise; or when special reports are called for, telegraphs them to Pittsburg.

Brownsville, Pa. (all the year).—Takes observations daily, at 7 a. m. and 2 p. m. and telegraphs them to Pittsburg in case of dangerous rise; or when called for, telegraphs special reports to Pittsburg.

Brunswick, Mo. (all the year).—Takes observations daily at 2 p. m. Telegraphs to Saint Louis in case of a dangerous rise and also telegraphs to Saint Louis when special reports are called for by the observer, and in case of ice dams or other obstructions in the river, and the opening and closing of navigation.

Burnside, Ky. (December to April, both inclusive).—Takes observations daily at 2 p. m. and transmits them by postal-card to Nashville. When river rises 6 feet or more during twenty-four hours, or rainfall equals or exceeds 2 inches the 2 p. m. observation is telegraphed to Nashville; also in case of dangerous rise or when called for by observer, Nashville, telegraphs him special reports at 8 a. m. and 8 p. m. Special reports are also made to Nashville of the formation or breaking up of ice in the river and of the opening and closing of navigation.

Carthage, Tenn. (December to April, both inclusive).—Takes observations daily at 2 p. m. and transmits by postal-card to Nashville. When river rises 5 feet or more during past twenty-four hours, or rainfall equals or exceeds 2 inches the 2 p. m. observation is telegraphed to Nashville; also in case of dangerous rise or when called for by observer, Nashville, special reports are made and telegraphed at 8 a. m. and 8 p. m. Special telegraphic reports are made on breaking up of ice, formation of obstructions, and opening and closing of navigation.

Charleston, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m. and transmits by postal-card to Chattanooga. In case of dangerous rise, or when special reports are called for, they are made at 8 a. m. and 8 p. m. and telegraphed to Chattanooga.

Clarion, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when called for, special reports are made to Pittsburg by telegraph.

Clinton, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal card to Chattanooga. In case of dangerous rise, or when called for, special observations are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

Colusa, Cal. (December 15 to May 1).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs special observations to Sacramento (consolidated with report from Red Bluff, if received).

Confience, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when called for, telegraphs special reports to Pittsburg.

Coushatta Chute, La. (all the year).—Takes observations daily at 2 p. m. and transmits by telegraph to Shreveport. In case of dangerous rise, or when called for, telegraphs special reports to Shreveport.

Decatur, Ala. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to "Signals, Washington."

Delhi, La. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when called for, special reports are telegraphed to New Orleans.

Eugene City, Oreg. (November 15 to December 15 and February 15 to May 1).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Portland, Oreg.

Evansville, Ind. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to "Signals, Washington."

Freeport, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when called for, telegraphs special reports to Pittsburg.

Folsom City, Cal. (December 15 to May 1).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs special reports to Sacramento.

Fulton, Ark. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Shreveport.

Grand Tower, Ill. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when special reports are called for, telegraphs to Cairo.

Girard, La. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when special reports are called for, telegraphs to New Orleans.

Harper's Ferry, W. Va. (—).—Takes observations in case of a sudden rise, &c., and telegraphs them to "Signals, Washington."

Helena, Ark. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, special observations are telegraphed to Vicksburg and "Signals, Washington."

Hermann, Mo. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs reports to Saint Louis and "Signals, Washington."

Jerome, Mo. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs reports to Saint Louis.

Johnstown, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and telegraphs to Pittsburg. In case of dangerous rise, or when called for, telegraphs special reports to Pittsburg.

Johnsonville, Tenn. (all the year).—Takes observations daily at 2 p. m., and in case of dangerous rise, telegraphs to "Signals, Washington."

Kansas City, Mo. (all the year).—Takes observations daily at 2 p. m., and in case of dangerous rise, telegraphs to Saint Louis and "Signals, Washington."

Kingston, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when called for, special reports are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

Leadvale, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when called for, special reports are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

Le Claire, Iowa (all the year).—Takes observations daily at 2 p. m., and in case of dangerous rise, telegraphs to "Signals, Washington."

Louisiana, Mo. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Saint Louis.

Loudon, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when called for, special reports are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

Mahoning, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Marietta, Ohio (all the year).—Takes observations daily at 2 p. m. In case of a dangerous rise, or when called for, telegraphs to "Signals, Washington."

Marysville, Cal. (December 15 to May 1).—Takes observations daily at 2 p. m. In case of a dangerous rise, special reports, consolidated with special reports from Oroville, are telegraphed to Sacramento.

Monroe, La. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when special reports are called for, telegraphs to New Orleans.

Morgantown, W. Va., (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Mount Carmel, Ill. (all the year).—Takes observations daily at 2 p. m.; in case of dangerous rise, telegraphs to postmaster Shawneetown, Ill.

Muscatine, Iowa (all the year).—Takes observations daily at 2 p. m.

New Geneva, Pa. (all the year).—Takes observations at 7 a. m. and 2 p. m. daily, and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Oil City, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and telegraphs to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Oroville, Cal. (December 15 to May 1).—Takes observations daily at 2 p. m. In case of dangerous rise, special observations are telegraphed to observer, Marysville, Cal.

Parker's Landing, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Paducah, Ky. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to "Signals, Washington."

Peoria, Ill. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Saint Louis and "Signals, Washington."

Plattsmouth, Nebr. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to "Signals, Washington."

Prescott, Wis. (all the year).—Takes observations daily at 2 p. m., and in case of dangerous rise, telegraphs to La Crosse.

Rockwood, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when called for, special observations are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

Rowlesburg, W. Va. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Saint Joseph, Mo. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, special reports are telegraphed to "Signals, Washington."

Salisbury, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Strawberry Plains, Tenn. (December to March, both inclusive).—Takes observations daily at 2 p. m., and transmits by postal-card to Chattanooga. In case of dangerous rise, or when special reports are called for, special observations are made at 8 a. m. and 8 p. m., and telegraphed to Chattanooga.

Umatilla, Oreg. (November 15 to December 15 and February 15 to July 1).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Portland, Oreg.

Wabasha, Minn. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to La Crosse.

Warsaw, Ill. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, telegraphs to Saint Louis and "Signals, Washington."

Warren, Pa. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Weston, W. Va. (all the year).—Takes observations daily at 7 a. m. and 2 p. m., and transmits by telegraph to Pittsburg. In case of dangerous rise, or when special reports are called for, telegraphs to Pittsburg.

Wheeling, W. Va. (all the year).—Takes observations daily at 2 p. m. In case of dangerous rise, or when called for, special reports are telegraphed to "Signals, Washington."

The following is a list of stations that have not yet gone into operation: Arkansas City, Ark. (Vicksburg center); Bayou Sara, La. (New Orleans center); Newport, Ark. (Vicksburg center); Yazoo City, Miss. (Vicksburg center); Camden, Ark. (New Orleans center); West Melville, La. (New Orleans center); Mount Holly, N. C. (Charleston center).

Orders have been issued for the establishment of the stations in the above list, and as soon as river-gauges are erected and observers appointed the observations will commence.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY.

APPENDIX 58.

REPORT ON THE COTTON-REGION SYSTEM.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, June 30, 1885.

SIR: I have now the honor to submit my report of the work done in stations division in connection with the system of cotton-region reports, for the year ending June 30, 1885.

This system was inaugurated in September, 1881, upon the earnest request of citizens interested in the cultivation of cotton. By the co-operation of the railway and telegraph officials where stations are located, it has been thoroughly organized and the reports are considered of inestimable value to the planters in the cotton region, and to cotton interests throughout the country.

The reports of rainfall and maximum and minimum temperatures are promptly distributed from the district centers, and all the leading cities of the South are supplied daily with the information they furnish; they are also published in the newspapers and bulletined at cotton exchanges and other prominent places, where they are readily accessible to business men and the general public.

The work when begun in 1881 was necessarily rather limited in extent, but it has since been greatly extended and systematized, so that it is now one of the most valuable features of the Signal Service. It is gratifying to state that the efforts made in this direction are fully appreciated by those in whose interest the system was established.

The reports are collected and disseminated throughout the commercial centers of the cotton region from April 1 to October 31 of each year; this year, however, owing to the small balance of the appropriation available for the purpose, the observations at the various stations were not commenced until May 1. Many protests were made by the cotton exchanges and the classes mostly interested in cotton, but it was found necessary either to take this action or close a large number of stations. It was thought best for all interests that the full number of stations be maintained, in consequence of which observations could not be commenced until May 1.

Observations of maximum and minimum temperatures and rainfall are taken simultaneously at all stations in the cotton region at 6 p. m., seventy-fifth meridian time. The manner of taking observations, telegraphing reports, and collecting and distributing the information at the centers has been continued as described in detail in my report for the year ending June 30, 1884.

The following is a description of the forms used in connection with this work:

Form 138 is a manifold bulletin showing the average maximum and minimum temperatures and rainfall for the several districts, for the past twenty-four hours, and is posted daily at each center, in prominent places most convenient to persons interested.

Form 138b is also a manifold bulletin and is used by the centers to show the maximum and minimum temperatures and rainfall at each station in their respective districts.

Form 144 is used by each cotton-region station to record the maximum and minimum temperatures, rainfall, time of taking observation and time of filing the report for transmission. The form is mailed to the district center at the end of each month, where it is critically examined and afterward forwarded to this office for use in the preparation of meteorological data.

Form 203 (card) is used by the observers at substations in enciphering the observations and, after the report has been transmitted by telegraph, it is retained and filed as part of the station records.

Form 150 (card) "Condition of Instruments," is used once each month by each station to report the condition of the meteorological instruments to the district center.

Form 144b is used to report the total amount of rainfall daily and weekly, at regular stations of the Signal Service in the cotton region. It is prepared at this office from the regular 7 a. m., 3 p. m., and 11 p. m. reports, and is mailed to observers and others on Saturday of each week. The information is furnished in the interest of cotton exchanges, merchants, and cotton planters. The form is sent to the Signal Service observers at Atlanta, Augusta, Baltimore, Charleston, Cincinnati, Galveston, Indianola, Jacksonville, Knoxville, Little Rock, Louisville, Lynchburg, Memphis, Mobile, Montgomery, Nashville, New Orleans, New York, Norfolk, Pensacola, Savannah, Shreveport, Vicksburg,

and Wilmington; also to the Board of Trade, Savannah, Ga., Commercial Bulletin, Boston, Mass., Mr. J. F. Wheless, Cotton Exchange, Nashville, Tenn., Mr. C. W. Simmons, secretary and treasurer, Cotton Exchange, Saint Louis, Mo., and the Secretary National Board of Health, Washington, D. C.

Each cotton-region station is supplied with the following: One instrument shelter; one maximum thermometer; one minimum thermometer; one rain-gauge and measuring stick; supply of official cards (forms 150 and 203) and forms 144.

Observations were continued during July, August, September, and October, 1884. They were discontinued October 31, 1884, and resumed May 1, 1885.

The various cotton-region stations are arranged in sections as follows:

Each section is under the observer in charge of a regular station of the Signal Service, which station is known as the "section center." When practicable the name of the section center is used to designate the section.

Cotton-region stations receive all instructions from or through and render all reports and bills to the section centers. Observers in charge of section centers receive, examine, and certify to the correctness of all reports and bills from special stations and then forward them to this office.

If reports or bills are not received at the section centers within three days after the date on which they are due, they are called for by mail. Any persistent neglect of the special stations in this direction is reported to the Chief Signal Officer with such recommendation as the observer may consider proper to make to improve the service. Defective reports which cannot be remedied at section centers are returned for correction. Section centers make a report to the Chief Signal Officer on the fifteenth day of each month of the reports which are missing for the previous month, giving the probable reason therefor.

In certifying to bills, great care is exercised to see that the time for which charge is made is correct, the vouchers properly signed, &c. Bills are not certified to until the reports which they cover are received and acted upon. Each bill bears the following certificate on its face, signed by the observer in charge of the section center: "The account is correct and just, and the services have been rendered as stated."

Bills are rendered on Form 9 (old Form 62a), and filled out as follows:

"For services as ———, at ———, for the month of ———, 188—, for ——— (give the number of reports), at ——— cents per report."

When an observation or report has been missed, the fact is noted on the face of the bill, for example, "No observations taken August 2 and 7." The bill is altered to agree with the work done.

Observers in charge of section centers are held responsible for the correctness of all bills certified to by them, and they are required to assure themselves of their accuracy before forwarding to this office.

The pay of the civilian observers continues at 20 cents per report made. The operators employed at centers, &c., collecting reports for concentration receive 5 cents per report.

Messengers are employed collecting reports from railroad offices at centers, &c., at the following places:

Houston, Tex., \$5 per month; New Orleans, La., \$15 per month; Selma, Ala., \$5 per month. Mr. J. H. McHugh, operator at New Orleans, is paid \$6 per month, by special authority, for receiving reports from Amite City, La., Brookhaven, Miss., and Hazlehurst, Miss. An operator is employed, by special authority, at Houston, Tex., to transfer reports to Galveston center, from six substations, at 5 cents per report.

The cotton-region station at Hempstead, Tex., under Galveston center, was discontinued March 14, 1885. The station at Whiteville, La., under New Orleans center, was discontinued June 10, 1885.

A cotton-region station was established at Port Gibson, Miss., under New Orleans center, June 10, 1885.

The committee on information and statistics, New Orleans Cotton Exchange, being desirous of obtaining complete data from all substations, requested that the observers be directed to send their retained Forms 144 to the New Orleans center for making out a monthly report. As it was not considered advisable to send the Forms 144, the observer in charge of each cotton-region center was instructed, March 20, 1885, to mail daily a copy of Form 138 to the New Orleans center.

Our observer at Shreveport, La., in letter of February 19, 1885, states that great interest is manifested in the Signal Service reports, and suggests that Shreveport be made a cotton-region center. He was told that the appropriation was not sufficient to admit of establishing new stations and making Shreveport a center. The observers at Galveston, Little Rock, and New Orleans were directed, on March 6, 1885, to mail daily to observer, Shreveport, a copy of Form 138b, containing reports from the stations in their districts.

Cotton-region stations have been requested at other points, but the limited appropriation would not admit of their being established.

The railroad companies generally and the various cotton exchanges throughout the cotton region have, as heretofore, extended many courtesies to our observers, and have aided in promoting the usefulness of this system of reports.

The list of railroads co-operating with the Signal Service in the distribution of the reports, given in my report for the year ending June 30, 1884, remains unchanged.

There are at present 155 stations taking observations and rendering reports, viz, nineteen regular Signal Service stations and 136 special cotton-region stations, as will be seen by the following list:

District centers.	Substations.
Atlanta, Ga.*.....	Anderson, S. C.; Cartersville, Ga.; Columbus, Ga.; Dalton, Ga.; Gainesville, Ga.; Greenville, S. C.; Griffin, Ga.; Macon, Ga.; Newnan, Ga.; Spartanburg, S. C.; Toccoa, Ga.; West Point, Ga.
Augusta, Ga.*.....	Allendale, S. C.; Athens, Ga.; Batesburg, S. C.; Blackville, S. C.; Camak, Ga.; Chester, S. C.; Columbia, S. C.; Greenwood, S. C.; Union Point, Ga.; Washington, Ga.; Waynesborough, Ga.
Charleston, S. C.*.....	Branchville, S. C.; Hardeeville, S. C.; Jacksonborough, S. C.; Kingstree, S. C.; Saint George's, S. C.; Saint Matthew's, S. C.; Yemassee, S. C.
Galveston, Tex.*.....	Austin, Tex.; Beaumont, Tex.; Belton, Tex.; Columbia, Tex.; Corsicana, Tex.; Cuero, Tex.; Dallas, Tex.; Hearne, Tex.; Houston, Tex.; Huntsville, Tex.; Longview, Tex.; Luling, Tex.; Orange, Tex.; *Palestine, Tex.; *San Antonio, Tex.; Sour Lake, Tex.; Tyler, Tex.; Waco, Tex.; Weatherford, Tex.; Weimar, Tex.
Little Rock, Ark.*.....	Arkansas City, Ark.; Brinkley, Ark.; Devall's Bluff, Ark.; *Fort Smith, Ark.; Helena, Ark.; Kensett, Ark.; Madison, Ark.; Magnolia, Ark.; Malvern, Ark.; Monticello, Ark.; Newport, Ark.; Paris, Tex.; Pine Bluff, Ark.; Prescott, Ark.; Russellville, Ark.; Texarkana, Ark.
Memphis, Tenn.*.....	Batesville, Miss.; Bolivar, Tenn.; Brownsville, Tenn.; Corinth, Miss.; Covington, Tenn.; Decatur, Ala.; Dyersburg, Tenn.; Grand Junction, Tenn.; Grenada, Miss.; Hernando, Miss.; Holly Springs, Miss.; Milan, Tenn.; *Nashville, Tenn.; Oxford, Miss.; Paris, Tenn.; Scottsborough, Ala.; Tusculumbia, Ala.; Withe, Tenn.
Mobile, Ala.*.....	Aberdeen, Miss.; Columbus, Miss.; Evergreen, Ala.; Livingston, Ala.; Macon, Miss.; Meridian, Miss.; Okolona, Miss.; Waynesborough, Miss.
Montgomery, Ala.*.....	Birmingham, Ala.; Calera, Ala.; Eufaula, Ala.; Fort Deposit, Ala.; Greenville, Ala.; Marton, Ala.; Pine Apple, Ala.; Opelika, Ala.; Selma, Ala.
New Orleans, La.*.....	Alexandria, La.; Amite City, La.; Brookhaven, Miss.; Cheneyville, La.; Coushatta Chute, La.; Hazlehurst, Miss.; Lafayette, La.; Minden, La.; Natchez, Miss.; Natchitoches, La.; Opelousas, La.; Port Gibson, Miss.; *Shreveport, La.
Savannah, Ga.*.....	Albany, Ga.; Allapaha, Ga.; Bainbridge, Ga.; *Cedar Keys, Fla.; Eastman, Ga.; Fernandina, Fla.; Fort Gaines, Ga.; Jessup, Ga.; Live Oak, Fla.; Millen, Ga.; Quitman, Ga.; Smithville, Ga.; Thomasville, Ga.; Waldo, Fla.; Way Cross, Ga.
Vicksburg, Miss.*.....	Edwards, Miss.; Jackson, Miss.; Lake, Miss.; Monroe, La.
Wilmington, N. C.*.....	*Charlotte, N. C.; Cheraw, S. C.; Florence, S. C.; Goldsborough, N. C.; Lumberton, N. C.; New Berne, N. C.; Raleigh, N. C.; Salisbury, N. C.; Wadesborough, N. C.; Weldon, N. C.

NOTE.—Stations marked thus * are regular Signal Service stations.

I am, sir, very respectfully, your obedient servant,

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,
Washington, D. C.

APPENDIX 59.

Classified list of stations of the Signal Service, United States Army, in operation on June 30, 1885, compiled in the stations division, for the annual report of the Chief Signal Officer for the year ending June 30, 1885.

[(1) Takes one observation per day, at sunset; (2) takes two observations per day; (3) takes three observations per day—all telegraphed; (3a) takes three observations per day—none telegraphed; (5) takes five observations per day—three telegraphed; (5a) takes five observations per day—one telegraphed; (5b) takes five observations per day—none telegraphed; (6) takes six observations per day—three telegraphed.]

Alabama.—Stations of the second order: Mobile (5), Montgomery (5). Special display station: Fort Morgan. Special river station: Decatur. Special cotton-region stations: Birmingham, Calera, Decatur, Eufaula, Evergreen, Greenville, Fort Deposit, Livingston, Marion, Pine Apple, Opelika, Scottsborough, Selma, Tusculumbia.

Alaska.—Stations of the second order: Fort Alexander (3a), Mumtrekhlagamut (3a), Fort Saint Michael's (3a), Sitka (3a), Unalashka (3a). Stations of the third order: Anvik (2), Atka (2), Cordova Bay (2), Hoochnahoo (2), Hoonyah (2), Kenai (2), Koskokvim (2), Port Etches (2), Pyramid Harbor (2), Tananah (2), Tcha-tow-klin (2), Fort Wrangell (2), Yakutat Bay (2), Golovin Bay (1), Harrisburg (or Juneau City) (1), Mission (1), Nuduckayet (1), Nulato (1), Fort Reliance (1), Saint George Island (1), Ugashik (1).

Arizona.—Stations of the second order: Fort Apache (3), Fort Grant, (3a), Prescott (6), Camp Thomas (3a), Yuma (5). Stations of the third order: Apache Pass (1), Maricopa (1), Fort McDowell (1), Phoenix (1), San Carlos Agency (1), Fort Verde (1), Wickenburg (1), Willcox (1). Repair station: Ash Fork.

Arkansas.—Stations of the second order: Fort Smith (5), Little Rock (5). Special River stations: Arkansas City, Camden, Fulton, Helena, Newport. Special cotton-region stations: Arkansas City, Brinkley, Devall's Bluff, Helena, Kensett, Madison, Magnolia, Malvern, Monticello, Newport, Pine Bluff, Prescott, Russellville, Texarkana.

Behring Sea.—Station of the second order: Behring's Island (3a).

California.—Stations of the second order: Fort Bidwell (3a), Cape Mendocino (5), Keeler (5b), Los Angeles (5), Red Bluff (5), Sacramento (5), San Diego (5), San Francisco (6), San Luis Obispo (5). Special River stations: Colusa, Folsom City, Maryville, Oroville.

Colorado.—Stations of the second order: Denver (5), Pike's Peak (5b), Montrose (3), West Las Animas (5). Station of the third order: Durango (1).

Connecticut.—Stations of the second order: New Haven (5), New London (5b). Special display stations: New Haven Light, Stonington.

Dakota.—Stations of the second order: Fort Bennett (3), Bismarck (5), Fort Buford (3), Deadwood (3), Huron (5), Fort Totten (3), Yankton (5). Stations of the third order: Fort Meade (1), Fort Sully (1), Webster (1), Fort Yates (1). Repair station: Larimore.

Delaware.—Station of the third order: Cape Henlopen.

District of Columbia.—Station of the first order: Washington (6).

Florida.—Stations of the second order: Cedar Keys (5), Jacksonville (5), Key West (5), Pensacola (5), Sanford (5). Special display stations: Fernandina, Fort George Island, Saint Augustine, Sand Key Light. Special cotton-region stations: Live Oak, Waldo, Fernandina.

Georgia.—Stations of the second order: Atlanta (5), Augusta (5), Savannah (5). Special display stations: Brunswick, Tybee Island. Special cotton-region stations: Albany, Allapaha, Athens, Bainbridge, Camak, Cartersville, Columbus, Dalton, Eastman, Fort Gaines, Gainesville, Griffin, Jessup, Macon, Millen, Newnan, Quitman, Smithville, Thomasville, Toccoa, Union Point, Washington, Way Cross, Waynesborough, West Point.

Idaho.—Stations of the second order: Boise City (5b), Lewiston (3). Stations of the third order: Fort Coeur d'Alene (1).

Illinois.—Stations of the second order: Cairo (5), Chicago (6), Springfield (5). Special river stations: Beardstown, Grand Tower, Peoria, Mount Carmel, Warsaw.

Indiana.—Stations of the second order: Greencastle (5), Indianapolis (5). Special river stations: Evansville. Special printing station: Logansport.

Indian Territory.—Station of the second order: Fort Sill (3). Stations of the third order: Fort Reno (1), Fort Supply (1). Repair station: Cantonment.

Iowa.—Stations of the second order: Davenport (5), Des Moines (5), Dubuque (5a), Keokuk (5). Special river stations: Le Claire, Muscatine. Special printing station: Burlington.

Kamchatka.—Station of the third order: Petropaulovski (2).

Kansas.—Stations of the second order: Dodge City (5), Leavenworth (5), Concordia (5).

Kentucky.—Station of the second order: Louisville (5). Special river stations: Burnside, Paducah.

Louisiana.—Stations of the second order: New Orleans (5), Shreveport (5). Special display station: Port Eads. Special river stations: Alexandria, Bayou Sara, Coushatta Chute, Delhi, Girard, Monroe, West Melville. Special cotton-region stations: Alexandria, Amite City, Cheneyville, Coushatta Chute, Lafayette, Minden, Monroe, Natchitoches, Opelousas.

Maine.—Stations of the second order: Eastport (5), Portland (5). Special display stations: Bath, Boothbay, Rockland, Southwest Harbor. Special printing station: Bangor.

Maryland.—Station of the second order: Baltimore (5). Station of the third order: Ocean City (1).

Massachusetts.—Station of the second order: Boston (6). Special display stations: Bass River Light, Fall River, Gloucester, Highland Light, Hyannis, Marblehead, New Bedford, Newburyport, Provincetown, Wood's Holl.

Michigan.—Stations of the second order: Alpena (5), Detroit (5), Escanaba (5), Grand Haven (5), Mackinaw City (5), Marquette (5), Port Huron (5). Special display stations: Bay City, Charlevoix, Cheboygan, East Tawas, Elk Rapids, Frankfort, Ludington, Manistee, Menominee, Montague, Muskegon, Northport, Pentwater, Petoskey, Saint Joseph, Sand Beach, South Haven, Traverse City.

Minnesota.—Stations of the second order: Duluth (3), Moorhead (5), Saint Paul (5), Saint Vincent (5). Special river station: Wabasha.

Mississippi.—Station of the second order: Vicksburg (5). Special cotton-region stations: Aberdeen, Batesville, Brookhaven, Columbus, Corinth, Edwards, Grenada, Hazlehurst, Hernando, Holly Springs, Jackson, Lake, Macon, Meridian, Natchez, Okolona, Oxford, Port Gibson, Waynesborough. Special river station: Yazoo City.

Missouri.—Stations of the second order: Saint Louis (6), Lamar (5). Special river stations: Boonville, Brunswick, Hermann, Jerome, Kansas City, Louisiana, Saint Joseph.

Montana.—Stations of the second order: Fort Assinaboine (3), Fort Benton (3), Fort Custer (3), Helena (3), Fort Maginnis (3), Poplar River (3), Fort Shaw (3). Repair stations: Galpin, Glendive, Terry's Landing.

Nebraska.—Stations of the second order: North Platte (5), Omaha (5), Valentine (5). Special river station: Plattsmouth. Repair station: Fort Robinson.

Nevada.—Station of the second order: Winnemucca (5).

New Hampshire.—Station of the second order: Mount Washington (5). Special display station: Portsmouth.

New Jersey.—Stations of the second order: Atlantic City (5), Barnegat City (5), Cape May (3a), Sandy Hook (5). Station of the third order: Little Egg Harbor (1).

New Mexico.—Stations of the second order: Fort Stanton (3), Santa Fé (5). Stations of the third order: Lava (1), Watrous (1).

New York.—Stations of the second order: Albany (5), Buffalo (5), New York City (6), Oswego (5), Rochester (5). Special display stations: Cape Vincent, Charlotte, City Island, Dunkirk, North Fair Haven.

North Carolina.—Stations of the second order: Charlotte (5), Hatteras (5), Kittyhawk (5), Fort Macon (5), Smithville (5), Wilmington (5). Stations of the third order: New River Inlet (1), Wash Woods (1). Special cotton-region stations: Goldsborough, Lumberton, New-Berne, Raleigh, Salisbury, Wadesborough, Weldon.

Ohio.—Stations of the second order: Cincinnati (6), Cleveland (5), Columbus (5), Sandusky (5), Toledo (5). Special river station: Marietta. Special display station: Ash-tabula.

Oregon.—Stations of the second order: Portland (5), Roseburg (5). Stations of the third order: Ashland (1), Astoria (1), Fort Klamath (1), Lakeview (1), Linkville (1). Special river stations: Albany, Eugene City, Umatilla.

Pennsylvania.—Stations of the second order: Erie (5), Philadelphia (6), Pittsburg (6). Special river stations: Brookville, Brownsville, Clarion, Confluence, Freeport, Johnstown, Mahoning, New Geneva, Oil City, Parker's Landing, Saltsburg, Warren.

Rhode Island.—Station of the second order: Block Island (5). Stations of the third order: Narragansett Pier (1); Point Judith (1). Special display stations: Bristol, Newport, Southeast Light, Block Island.

South Carolina.—Station of the second order: Charleston (5). Special display station: Port Royal. Special cotton-region stations: Allendale, Anderson, Batesburg, Blackville, Branchville, Cheraw, Chester, Columbia, Florence, Greenville, Greenwood, Hardeeville, Jacksonborough, Kingstree, Saint George's, Saint Matthew's, Spartanburg, Yemassee.

Tennessee.—Stations of the second order: Chattanooga (5), Knoxville (5), Memphis (5), Nashville (5). Special river stations: Charleston, Clinton, Johnsonville, Carthage, Kingston, Leadvale, Rockwood, London, Strawberry Plains. Special cotton-region stations: Bolivar, Brownsville, Covington, Dyersburg, Grand Junction, Milan, Paris, Withe.

Texas.—Stations of the second order: Brownsville (3), Fort Concho (5), Fort Davis (3a), Fort Elliott (3), El Paso (5), Galveston (5), Indianola (5), Palestine (5), Rio Grande City (5), San Antonio (3), Fort Stockton (3). Stations of the third order: Henrietta (1), Marfa (1). Special display station: Corpus Christi. Special cotton-region stations: Austin, Beaumont, Belton, Columbia, Corsicana, Cuero, Dallas, Hearne, Houston, Huntsville, Longview, Luling, Orange, Paris, San Antonio, Sour Lake, Tyler, Waco, Weatherford, Weimar.

Utah.—Stations of the second order: Salt Lake City (5), Frisco (5b).

Virginia.—Stations of the second order: Cape Henry (5), Chincoteague (5), Lynchburg (5), Fort Myer (5), Norfolk (5). Special display station: Fort Monroe.

Washington Territory.—Stations of the second order: Fort Canby (5), Dayton (3a), Olympia (5), Port Angeles (3), Spokane Falls (3), Tatoosh Island (3). Stations of the third order: Neah Bay (1), Pysht (1), Fort Spokane (1).

West Virginia.—Special river stations: Morgantown, Rowlesburg, Weston, Wheeling.

Wisconsin.—Stations of the second order: La Crosse (5), Milwaukee (5). Special display stations: Ahnapee, Green Bay, Kenosha, Kewaunee, Manitowoc, Racine, Sheboygan, Sturgeon Bay. Special river station: Prescott.

Wyoming.—Stations of the second order: Fort Bridger (5), Cheyenne (5). Station of the third order: Fort Laramie (1). Repair station: Carter.

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

APPENDIX 6o.

REPORT ON THE DISPLAY OF CAUTIONARY SIGNALS AT SPECIAL STATIONS.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, June 30, 1885.

SIR: I have the honor to make the following report upon the special cautionary-signal display stations of the Signal Service in operation during the year ending June 30, 1885:

The special display stations are located on the Great Lakes, the Atlantic coast, and the Gulf coast. They are grouped in sections, each section being under the supervision of the observer in charge of a regular Signal Service station as near the center of the section as possible, who receives orders to hoist and lower signals at stations in his section direct from this office.

Displaymen hoist the cautionary signal upon receipt of the order from the observer in charge of their section and acknowledge receipt to him immediately by telegraph. They also bulletin the order and accompanying message for the information of shipping interests. When signals are ordered down they acknowledge receipt by telegraph, giving the maximum velocity of wind and direction during the display. In the absence of instruments, the wind velocity is determined by the Signal Service scale.

The cautionary signal when displayed signifies:

1. That it is thought probable from a study of the weather reports received at the central office, that dangerous winds will prevail at or in the vicinity of the place at which the signal is displayed.
2. That the danger appears to be so great as to demand precaution on the part of mariners and others, and general preparation for rough weather.
3. It calls for frequent examination of local barometers, and other instruments, and the study of the local signs of the weather, as clouds, &c.

Each display station is supplied with two or more red flags, one 6 feet and the other 8 feet square, having square black centers one-third the size of the flag; two red signal-lanterns, one large flag-staff, and one wind-vane. Stations designated to display cautionary off-shore or northwest signals are, in addition, supplied with white flags with black centers and with white lanterns. The flag-staff is at least 25 feet in height, and so placed as to make the signal clearly visible from the harbor and shipping. The necessary stationery and supply of Forms 112 are also sent to each station.

Form 112, containing the data relative to the display of signals, is forwarded weekly to the observer in charge of the section from each display station in the section.

As soon as practicable after a cautionary signal has been lowered, the displayman collects from mariners and others, data concerning the violence of the storm, the nature and extent of disasters and other casualties, and the benefits derived from the display of the signals. These statements include everything within the displayman's personal knowledge. The information so collected is entered in the column of "Remarks," on Form 112, or, when that column is filled, it is made on a sheet of paper, which is afterwards attached to that form. It is also stated whether any storm passed over the station during the week for which cautionary signals were not ordered, and newspaper clippings having reference to storms are used to accompany the report.

Displaymen receive all instructions from or through, and render all reports and bills to, the section centers. Observers in charge of section centers receive, examine, and certify to the correctness of all reports and bills from special display stations, and then forward them to this office.

If reports or bills are not received at the section centers within three days after the date on which they are due, they are called for by mail. Any persistent neglect of the displaymen in this direction is reported to the Chief Signal Officer, with such recommendation as the observer may consider proper to make to improve the service. When errors are detected in Forms 112 which cannot be remedied at the section centers, they are returned to the displayman for correction.

In certifying to bills great care is exercised to see that the time for which charge is made is correct, the vouchers properly signed, &c. Bills are not certified to until the

reports which they cover have been received and acted upon. Each bill bears the following certificate on its face, signed by the observer in charge of the section center:

"The account is correct and just, and the services have been rendered as stated."

Bills are rendered on Form 9 (old Form 62a), and filled out as follows:

"For services rendered as displayman, at ———, for the month of ———, 188—, for ——— (give the number of days), at ——— cents per day."

Observers in charge of centers are held responsible for the correctness of all bills certified to by them, and they are required to assure themselves of their accuracy before forwarding to this office.

As a rule the special display stations on the lakes display signals only during the season of navigation, which generally continues from about April 15 to December 15 of each year; those on the Atlantic and Gulf coasts display throughout the year. The lake stations at South Haven, Mich., Saint Joseph, Mich., and Ludington, Mich., also display signals during the entire year.

Displaymen are paid by this Service only during the season for which signals are displayed.

There are fifty-nine displaymen who receive pay at the rate of 25 cents per day; one at 35 cents per day; two at 50 cents per day, and one at \$15 per month. The displaymen at Wood's Holl, Mass., receives \$3 per month extra compensation for special service.

The display stations are thoroughly organized and equipped, and the displaymen fully instructed in their duties, which they perform conscientiously and intelligently. The large amount of valuable property saved and the assistance rendered mariners and others each year by means of this system of storm warnings, make it impossible to overestimate its importance to the shipping and commercial interests of the country.

The following have been established as special display stations during the year: Cheboygan, Mich., July, 23, 1884; repeats Mackinaw City signals. Port Eads, La., January 15, 1885, will repeat New Orleans signals. Arrangements for the display of signals have not yet been made at this point.

The following special display stations have been discontinued during the year: Fire Island, N. Y., December 1, 1884; Fort Mackinac, Mich., March 14, 1885; Saint Ignace, Mich., March 14, 1885.

The order of October 6, 1884, establishing Jump, La., as a special-display station, was revoked January 15, 1885.

The following is a list of stations inspected during the year. The inspectors state that they found the displaymen to be energetic and competent men, the signals considered to be of great value, and much interest manifested at all places where signals are displayed. The property was found generally in good condition.

Station inspected.	Date.	Name of inspector.
1885.		
Ahnapee, Wis.....	May 29.....	Sergt. S. W. Rhode.
Ashtabula, Ohio.....	April 24.....	Sergt. Peter Wood.
Bath, Me.....	April 27.....	Sergt. G. Liebmann.
Bay City, Mich.....	April 29.....	Sergt. N. B. Conger.
Brunswick, Ga.....	March 18.....	Sergt. S. C. Emery.
Bass River Light, Mass.....	May 22.....	Sergt. O. B. Cole.
Bristol, R. I.....	June 15.....	Sergt. J. G. Lynch.
Boothbay, Me.....	May 4.....	Sergt. G. Leibmann.
Cape Vincent, N. Y.....	April 23.....	Sergt. J. G. Linsley.
Charlotte, N. Y.....	April 21.....	Sergt. E. W. McGann.
Corpus Christi, Tex.....	May 12.....	Sergt. I. A. Reed.
Charlevoix, Mich.....	June 6.....	Sergt. T. B. Jennings.
Cheboygan, Mich.....	June 9.....	Sergt. T. B. Jennings.
City Island, N. Y.....	April 21.....	Sergt. W. W. Eichelberger.
Dunkirk, N. Y.....	April 25.....	Sergt. Peter Wood.
Elk Rapids, Mich.....	June 6.....	Sergt. T. B. Jennings.
East Tawas, Mich.....	April 30.....	Sergt. N. B. Conger.
Fernandina, Fla.....	April 28.....	Sergt. J. W. Smith.
Fort Monroe, Va.....	April 23.....	Sergt. J. P. Sherry.
Frankfort, Mich.....	June 1.....	Sergt. T. B. Jennings.
Fall River, Mass.....	June 16.....	Sergt. J. G. Lynch.
Fort George Island, Fla.....	April 28.....	Sergt. J. W. Smith.
Fort Morgan, Ala.....	April 23.....	Sergt. A. Pritchard.
Gloucester, Mass.....	June 9.....	Sergt. O. B. Cole.
Green Bay, Wis.....	June 1.....	Sergt. S. W. Rhode.
Hyannis, Mass.....	May 20.....	Sergt. O. B. Cole.
Highland Light, Mass.....	May 24.....	Sergt. O. B. Cole.
Kenosha, Wis.....	May 20.....	Sergt. S. W. Rhode.
Kewaunee, Wis.....	May 26.....	Sergt. S. W. Rhode.
Ludington, Mich.....	May 31.....	Sergt. T. B. Jennings.
Manistee, Mich.....	May 31.....	Sergt. T. B. Jennings.
Manitowoc, Wis.....	May 23.....	Sergt. S. W. Rhode.
Montague, Mich.....	May 30.....	Sergt. T. B. Jennings.

Station inspected.	Date.	Name of inspector.
	1885.	
Muskegon, Mich.	May 29	Sergt. T. B. Jennings.
Marblehead, Mass.	June 9	Sergt. O. B. Cole.
Menominee, Mich.	June 3	Sergt. S. W. Rhode.
New Bedford, Mass.	May 18	Sergt. O. B. Cole.
North Fair Haven, N. Y.	April 22	Sergt. J. G. Linsley
Newport, R. I.	June 17	Sergt. J. G. Lynch.
Northport, Mich.	June 4	Sergt. T. B. Jennings.
Newburyport, Mass.	June 10	Sergt. O. B. Cole.
New Haven Light, Conn.	May 4	Sergt. J. H. Sherman.
Pentwater, Mich.	May 30	Sergt. T. B. Jennings.
Port Royal, S. C.	March 18	Sergt. S. C. Emery.
Petoskey, Mich.	June 8	Sergt. T. B. Jennings.
Portsmouth, N. H.	June 10	Sergt. O. B. Cole.
Provincetown, Mass.	May 23	Sergt. O. B. Cole.
Racine, Wis.	May 19	Sergt. S. W. Rhode.
Rockland, Me.	April 29	Sergt. G. Liebmann.
Sand Beach, Mich.	May 2	Sergt. N. B. Conger.
Sand Key Light, Fla.	April 27	Sergt. J. Harvey Smith.
Sheboygan, Wis.	May 22	Sergt. S. W. Rhode.
Stonington, Conn.	May 18	Sergt. J. G. Lynch.
Southeast Light, R. I.	April 27	Sergt. J. T. Elker.
South Haven, Mich.	May 28	Sergt. T. B. Jennings.
Southwest Harbor, Me.	May 1	Sergt. G. Liebmann.
Saint Augustine, Fla.	April 28	Sergt. J. W. Smith.
Saint Joseph, Mich.	May 26	Sergt. T. B. Jennings.
Sturgeon Bay, Wis.	May 30	Sergt. S. W. Rhode.
Traverse City, Mich.	June 5	Sergt. T. B. Jennings.
Tybee Island, Ga.	March 18	Sergt. S. C. Emery.
Wood's Holl, Mass.	May 20	Sergt. O. B. Cole.

The following is the list of special display stations now in operation, arranged in sections:

Mackinaw section (Chicago, Ill., center).—Charlevoix, Mich.; Cheboygan, Mich.; Elk Rapids, Mich.; Frankfort, Mich.; Northport, Mich.; Petoskey, Mich.; Traverse City, Mich.

Grand Haven section (Chicago, Ill., center).—Ludington, Mich.; Manistee, Mich.; Montague, Mich.; Muskegon, Mich.; Pentwater, Mich.; Saint Joseph, Mich.; South Haven, Mich.

Milwaukee section (Milwaukee, Wis., center).—Kenosha, Wis.; Manitowoc, Wis.; Sheboygan, Wis.; Racine, Wis.

Green Bay section (Milwaukee, Wis., center).—Ahnapee, Wis.; Green Bay, Wis.; Sturgeon Bay, Wis.; Kewaunee, Wis.; Menominee, Mich.

Saginaw Bay section (Detroit, Mich., center).—Bay City, Mich.; East Tawas, Mich.; Sand Beach, Mich.

Eric section (Erie, Pa., center).—Ashtabula, Ohio; Dunkirk, N. Y.

Oswego section (Oswego, N. Y., center).—Cape Vincent, N. Y.; North Fair Haven, N. Y.

Portland section (Portland, Me., center).—Bath, Me.; Boothbay, Me.; Rockland, Me.; Southwest Harbor, Me.

Boston section (Boston, Mass., center).—Gloucester, Mass.; Marblehead, Mass.; Newburyport, Mass.; Portsmouth, N. H.

Wood's Holl section (Boston, Mass., center).—Bass River Light, Mass.; Highland Light, Mass.; Hyannis, Mass.; New Bedford, Mass.; Provincetown, Mass.; Wood's Holl, Mass.

Newport section (New London, Conn., center).—Bristol, R. I.; Fall River, Mass.; Newport, R. I.; Stonington, Conn.

Narragansett section (Narragansett Pier, R. I., center).—Southeast Light, R. I.

Savannah section (Savannah, Ga., center).—Brunswick, Ga.; Port Royal, S. C.; Tybee Island, Ga.

Jacksonville section (Jacksonville, Fla., center).—Fernandina, Fla.; Fort George Island, Fla.; Saint Augustine, Fla.

The following-named stations repeat cautionary signal orders issued to the stations set opposite their respective names:

Charlotte, N. Y.	Rochester, N. Y.
City Island, N. Y.	New York City.
Corpus Christi, Tex.	Indianola, Tex.
Fort Morgan, Ala.	Mobile, Ala.
New Haven Light, Conn.	New Haven, Conn.
Port Eads, La.	New Orleans, La.
Sand Key Light, Fla.	Key West, Fla.

Milwaukee, Wis., notifies by telegraph the postmasters at Ashland, Wis., and Houghton, Mich., of orders to hoist cautionary signals at Duluth, Minn., and Marquette, Mich.

Pensacola, Fla., notifies Apalachicola, Fla., of all cautionary signal orders for Pensacola.

Fort Monroe, Va., receives orders to hoist signals from Washington, D. C.

I am, very respectfully, your obedient servant.

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER OF THE ARMY,
Washington, D. C.

APPENDIX 61.

List of stations of the first and second order, Signal Service, United States Army, established since November 1, 1870, together with the dates on which those not in operation on June 30, 1885, were closed.

Station.	Established.	Remarks.
Albany, N. Y.	Dec. 22, 1873	
Alexander, Fort, Alaska	Aug. 1, 1881	
Alpena, Mich.	Sept. 10, 1872	
Apache, Fort, Ariz.	Oct. 9, 1877	
Assinaboine, Fort, Mont.	Oct. 6, 1879	
Atlanta, Ga.	Sept. 25, 1878	
Atlantic City, N. J.	Dec. 10, 1873	
Augusta, Ga.	Nov. 2, 1870	
Baltimore, Md.	Jan. 1, 1871	
Barnegat City, N. J.	Dec. 10, 1873	
Behring's Island, Behring Sea.	May 22, 1882	
Bennett, Fort, Dak.	Dec. 22, 1879	
Benton, Fort, Mont.	Nov. 25, 1871	Closed July 31, 1876; re-established October 11, 1879.
Bidwell, Fort, Cal.	Jan. 1, 1885	
Billings, Mont.	Jan. 1, 1883	Closed June 24, 1883.
Bismarck, Dak.	Sept. 15, 1874	
Block Island, R. I.	Sept. 1, 1880	
Boerne, Tex.	May 6, 1876	Closed July 23, 1880.
Boise City, Idaho.	July 1, 1877	
Boston, Mass.	Nov. 1, 1870	
Brackettville, Tex.	Sept. 1, 1875	Closed December 16, 1881.
Breckenridge, Minn.	Apr. 10, 1872	Closed November 30, 1880.
Bridger, Fort, Wyo.	Jan. 1, 1885	
Brownsville, Tex.	Aug. 25, 1875	
Buffalo, N. Y.	Nov. 1, 1870	
Buford, Fort, Dak.	Oct. 23, 1878	
Burkes, Ariz.	Dec. 5, 1877	Closed December 4, 1880.
Burlington, Vt.	May 24, 1871	Closed June 15, 1883.
Calro, Ill.	June 1, 1871	
Campo, Cal.	Jan. —, 1874	Closed September 30, 1882.
Canby, Fort, Wash.	Sept. 1, 1883	
Cape Hatteras, N. C.	Aug. 18, 1874	Closed November 30, 1880.
Cape Henry, Va.	Dec. 15, 1873	
Cape Lookout, N. C.	May 14, 1876	Closed December 31, 1880.
Cape May, N. J.	May 24, 1871	
Cape Mendocino, Cal.	July 27, 1882	
Castroville, Tex.	Sept. 29, 1875	Closed March 29, 1882.
Cedar Keys, Fla.	Nov. 7, 1879	
Champaign, Ill.	Oct. 13, 1880	Closed March 31, 1883.
Charleston, S. C.	Jan. 5, 1871	
Charlotte, N. C.	Oct. 6, 1878	
Chattanooga, Tenn.	Jan. 8, 1879	
Cheyenne, Wyo.	Nov. 1, 1870	
Chicago, Ill.	Nov. 1, 1870	
Chimo, Fort, Ungava Bay, Labrador	Nov. 1, 1882	Closed August 25, 1884.
Chincoteague, Va.	Mar. 16, 1880	
Cincinnati, Ohio.	Nov. 1, 1870	
Cleveland, Ohio.	Nov. 1, 1870	
Coleman City, Tex.	July 1, 1877	Closed September 5, 1883.
Colorado Springs, Colo.	Nov. 12, 1873	Closed July 31, 1876.
Columbus, Ohio.	July 1, 1878	
Concho, Fort, Tex.	Oct. 10, 1875	
Concordia, Kans.	Jan. 27, 1885	
Corinne, Utah.	Sept. 1, 1871	Closed March 14, 1874.
Corsicana, Tex.	Sept. 15, 1874	Closed October 31, 1881.
Craig, Fort, N. Mex.	May 21, 1877	Closed June 27, 1879.
Custer, Fort, Mont.	Dec. 5, 1878	Closed December 31, 1882; re-established July 21, 1883.
Davenport, Iowa	May 24, 1871	
Davis, Fort, Texas	Dec. 24, 1877	
Dayton, Wash.	July 1, 1879	
Deadwood, Dak.	Dec. 18, 1877	Closed June 1, 1878; re-established November 1, 1878.
Decatur, Tex.	Feb. 1, 1876	Closed September 10, 1883.

List of stations of the first and second order, Signal Service, United States Army, established since November 1, 1870, together with the dates on which those not in operation on June 30, 1885, were closed—Continued.

Station.	Established.	Remarks.
Delaware Breakwater, Delaware.....	Jan. 28, 1880	Closed March 1, 1885.
Denison, Tex.....	Dec. 16, 1874	Closed March 31, 1883.
Denver, Colo.....	Nov. 19, 1871	
Des Moines, Iowa.....	Aug. 1, 1878	
Detroit, Mich.....	Nov. 1, 1870	
Dodge City, Kans.....	Sept. 15, 1874	
Dubuque, Iowa.....	July 10, 1873	
Duluth, Minn.....	Nov. 1, 1870	
Eagle Pass, Tex.....	Jan. 19, 1875	Closed June 15, 1883.
Eagle Rock, Idaho.....	Dec. 8, 1880	Closed June 15, 1883.
Eastport, Me.....	Apr. 1, 1873	
Elliott, Fort, Tex.....	Nov. 29, 1879	
El Paso, Tex.....	Nov. 5, 1877	
Erie, Pa.....	May 25, 1873	
Escanaba, Mich.....	May 24, 1871	
Evanston, Ill.....	Aug. 31, 1875	Closed July 31, 1876.
Florence, Ariz.....	Nov. 12, 1874	Closed April 30, 1882.
Fort Smith, Ark.....	June 1, 1882	
Fredericksburg, Tex.....	Mar. 14, 1876	Closed February 25, 1883.
Frisco, Utah.....	Jan. 27, 1885	
Galveston, Tex.....	Apr. 19, 1871	
Gibson, Fort, Ind. T.....	Apr. 1, 1873	Closed May 13, 1882.
Grand Haven, Mich.....	May 24, 1871	
Grant, Fort, Ariz.....	Nov. 1, 1875	
Greencastle, Ind.....	July 23, 1884	
Griffin, Fort, Tex.....	July 1, 1875	Closed April 14, 1882.
Hatteras, N. C.....	Dec. 1, 1880	
Helena, Mont.....	Oct. 15, 1879	
Henrietta, Tex.....	Feb. 1, 1877	Closed May 25, 1878; re-established Feb- ruary 9, 1879; closed March 31, 1883.
Hidalgo (Edinburg), Tex.....	Feb. 1, 1879	Closed January 27, 1882.
Huron, Dak.....	July 1, 1881	
Indianapolis, Ind.....	Feb. 10, 1871	
Indianola, Tex.....	May 1, 1872	
Jacksborough, Tex.....	May 8, 1875	Closed June 15, 1883.
Jacksonville, Fla.....	Sept. 11, 1871	
Keeler, Cal.....	Feb. 1, 1885	
Keogh, Fort, Mont.....	Nov. 18, 1878	Closed June 15, 1883.
Keokuk, Iowa.....	July 16, 1871	
Kew West, Fla.....	Nov. 1, 1870	
Kitty Hawk, N. C.....	Jan. 15, 1875	
Knoxville, Tenn.....	Jan. 1, 1871	
La Crosse, Wis.....	Oct. 15, 1872	
Lady Franklin Bay, Grinnell Land.....	Aug. 5, 1881	Closed August 9, 1883.
Lake City, Fla.....	Nov. 1, 1879	Closed October 31, 1874.
Lamar, Mo.....	Oct. 17, 1884	
La Mesilla, N. Mex.....	June 16, 1876	Closed August 6, 1882.
Laredo, Tex.....	Dec. 16, 1875	Closed December 16, 1881.
Lead City, Dak.....	June 1, 1878	Closed October 31, 1878.
Leavenworth, Kans.....	May 21, 1871	
Lewiston, Idaho.....	July 1, 1879	
Lexington, Ky.....	Oct. 1, 1872	Closed July 24, 1876.
Little Rock, Ark.....	July 1, 1879	
Long Branch, N. J.....	Dec. 10, 1873	Closed July 8, 1876.
Los Angeles, Cal.....	July 1, 1877	
Louisville, Ky.....	Sept. 11, 1871	
Lynchburg, Va.....	May 24, 1871	
Mackinaw City, Mich.....	Aug. 20, 1882	
Macon, Fort, N. C.....	May 23, 1878	
Madison, Wis.....	Sept. 29, 1878	Closed March 31, 1883.
Maginnis, Fort, Mont.....	July 14, 1882	
Malone, N. Y.....	Aug. 1, 1875	Closed April 30, 1877.
Manhattan, Kans.....	Dec. 21, 1875	Closed July 31, 1876.
Marquette, Mich.....	May 1, 1871	Office burned February 1, 1885; re-es- tablished March 1, 1885.
Mason, Tex.....	Feb. 7, 1876	Closed April 14, 1882.
McKavett, Fort, Tex.....	Oct. 19, 1875	Closed February 19, 1883.
Memphis, Tenn.....	Feb. 28, 1871	
Milwaukee, Wis.....	Nov. 1, 1870	
Missoula, Fort, Mont.....	Dec. 15, 1879	Closed June 15, 1883.
Mobile, Ala.....	Nov. 7, 1870	Office burned November 17, 1880; re-es- tablished November 22, 1880.
Montgomery, Ala.....	Nov. 9, 1870	
Montrose, Colo.....	Feb. 5, 1885	
Moorhead, Minn.....	Jan. 1, 1881	
Morgantown, W. Va.....	Jan. 25, 1873	Closed March 31, 1883.
Mount Washington, N. H.....	Dec. 1, 1870	
Mumtrekhlagnut, Alaska.....	Mar. 24, 1885	
Nashville, Tenn.....	Nov. 1, 1870	

List of stations of the first and second order, Signal Service, United States Army, established since November 1, 1870, together with the dates on which those not in operation on June 30, 1885, were closed—Continued.

Station.	Established.	Remarks.
New Haven, Conn.....	Dec. 10, 1872	
New London, Conn.....	Jan. 10, 1871	
New Orleans, La.....	Nov. 1, 1870	
Newport, R. I.....	Aug. 1, 1875	Closed March 31, 1883.
New York City.....	Nov. 1, 1870	
Norfolk, Va.....	Jan. 1, 1871	
North Platte, Nebr.....	Sept. 15, 1874	
Olympia, Wash.....	July 1, 1877	
Omaha, Nebr.....	Nov. 1, 1870	
Ooglaanie, Point Barrow, Alaska.....	Oct. 17, 1881	Closed August 7, 1883.
Oswego, N. Y.....	Nov. 1, 1870	
Palestine, Tex.....	Dec. 3, 1881	
Peck's Beach, N. J.....	Dec. 10, 1873	Closed February 23, 1876.
Pembina, Dak.....	Nov. 1, 1872	Closed September 3, 1880.
Pensacola, Fla.....	Oct. 27, 1879	
Philadelphia, Pa.....	Jan. 1, 1871	
Phoenix, Ariz.....	Aug. 18, 1876	Closed December 31, 1881.
Pike's Peak, Colo.....	Nov. 1, 1873	
Pilot Point, Tex.....	June 18, 1875	Closed March 31, 1881.
Pioche, Nev.....	July 29, 1877	Closed June 15, 1883.
Pittsburg, Pa.....	Nov. 1, 1870	
Poplar River, Mont.....	May 1, 1882	
Port Angeles, Wash.....	Feb. 1, 1885	
Port Eads, La.....	Apr. 10, 1881	Closed March 31, 1883.
Port Huron, Mich.....	July 25, 1874	
Portland, Me.....	Jan. 15, 1871	
Portland, Oreg.....	Nov. 1, 1871	
Portsmouth, N. C.....	Apr. 23, 1876	Closed July 31, 1883.
Prescott, Ariz.....	Nov. 19, 1873	
Provincetown, Mass.....	Feb. 15, 1882	Closed April 1, 1884.
Punta Rassa, Fla.....	Aug. 15, 1871	Closed June 15, 1883.
Red Bluff, Cal.....	July 1, 1877	Office burned August 2, 1880; re-established August 16, 1880; burned August 18, 1882; re-established Sept. 28, 1882.
Rio Grande City, Tex.....	May 28, 1875	Closed September 30, 1882; re-established October 1, 1883.
Rochester, N. Y.....	Nov. 1, 1870	Closed June 15, 1883; re-established October 10, 1883.
Roseburg, Oreg.....	July 15, 1877	Office burned August 19, 1884; re-established October 25, 1884.
Sacramento, Cal.....	July 1, 1877	
Saint Louis, Mo.....	Nov. 1, 1870	
Saint Marks, Fla.....	Nov. 10, 1874	Closed October 30, 1879.
Saint Michael's, Fort, Alaska.....	June 27, 1874	
Saint Paul, Minn.....	Nov. 1, 1870	
Saint Paul's Island, Alaska.....	Aug. 18, 1872	Closed December 31, 1882.
Saint Vincent, Minn.....	Sept. 5, 1880	
Salt Lake City, Utah.....	Mar. 19, 1874	
San Antonio, Tex.....	Sept. 22, 1875	Closed June 15, 1883; re-established January 1, 1885.
San Diego, Cal.....	Nov. 1, 1871	
Sandusky, Ohio.....	Aug. 2, 1877	Closed March 31, 1883; re-established July 20, 1883.
Sandy Hook, N. J.....	Dec. 10, 1873	
Sanford, Fla.....	Sept. 1, 1882	
San Francisco, Cal.....	Mar. 8, 1871	
San Luis Obispo, Cal.....	Jan. 27, 1885	
Santa Fé, N. Mex.....	Nov. 20, 1871	Closed June 15, 1883; re-established September 24, 1884.
Savannah, Ga.....	Jan. 1, 1871	
Shaw, Fort, Mont.....	Apr. 1, 1880	
Shreveport, La.....	Sept. 3, 1871	
Sill, Fort, Ind. T.....	June 23, 1875	
Silver City, N. Mex.....	May 15, 1878	Closed March 31, 1883.
Sitka, Alaska.....	Mar. 30, 1881	
Smithville, N. C.....	Oct. 15, 1875	
Socorro, N. Mex.....	July 1, 1879	Closed May 23, 1881.
Spokane Falls, Wash.....	Feb. 5, 1881	Office burned November 29, 1884; re-established November 30, 1884.
Springfield, Ill.....	July 1, 1879	
Springfield, Mass.....	July 19, 1873	Closed December 31, 1882.
Springfield, Mo.....	Jan. 3, 1882	Closed June 15, 1883.
Squan Beach, N. J.....	Dec. 10, 1873	Closed February 26, 1876.
Stanton, Fort, N. Mex.....	Jan. 1, 1885	
Stanwix, Ariz.....	Jan. 25, 1876	Closed December 1, 1877.
Starkville, Miss.....	May 4, 1882	Closed June 15, 1883.
Stevenson, Fort, Dak.....	Sept. 19, 1878	Closed June 15, 1883.
Stockton, Fort, Tex.....	Feb. 25, 1876	
Sully, Fort, Dak.....	May 1, 1872	Closed October 31, 1877.

List of stations of the first and second order, Signal Service, United States Army, established since November 1, 1870, together with the dates on which those not in operation on June 30, 1885, were closed—Continued.

Station.	Established.	Remarks.
Tatoosh Island, Wash.....	Oct. 1, 1883	
Thatcher's Island, Mass.....	Dec. 26, 1875	Closed June 1, 1883.
Thomas, Camp, Ariz.....	Sept. 22, 1877	
Toledo, Ohio.....	Nov. 1, 1870	
Totten, Fort, Dak.....	Oct. 8, 1883	
Tucson, Ariz.....	Oct. 30, 1875	Closed June 15, 1883.
Tybee Island, Ga.....	June 11, 1874	Closed February 13, 1879.
Umatilla, Oreg.....	July 15, 1877	Closed March 31, 1883.
Unalashka, Alaska.....	Aug. 18, 1878	
Uyalde, Tex.....	Sept. 6, 1875	Closed October 31, 1882.
Valentine, Nebr.....	Jan. 27, 1885	
Verde, Fort, Ariz.....	Nov. 9, 1874	Closed October 10, 1883.
Vicksburg, Miss.....	Sept. 10, 1871	Office burned April 21, 1885; re-established April 23, 1885.
Virginia City, Mont.....	Nov. 25, 1871	Closed November 18, 1880.
Visalia, Cal.....	July 1, 1877	Closed June 15, 1883.
Washakie, Fort, Wyo.....	Dec. 1, 1881	Closed June 15, 1883.
Washington City.....	Nov. 1, 1870	
West Las Animas, Colo.....	Oct. 1, 1881	
Wickenburg, Ariz.....	Jan. 6, 1874	Closed April 30, 1882.
Williamsport, Pa.....	Jan. 1, 1882	Closed June 15, 1883.
Wilmington, N. C.....	Jan. 1, 1871	
Winnemucca, Nev.....	July 1, 1877	Closed June 15, 1883; re-established October 6, 1884.
Wood's Holl, Mass.....	Dec. 4, 1872	Closed January 31, 1882.
Wytheville, Va.....	Jan. 16, 1873	Closed July 31, 1876.
Yankton, Dak.....	Apr. 1, 1873	
Yuma, Ariz.....	Nov. 18, 1873	

APPENDIX 63.

Report of the Telegraph Division for the year ending June 30, 1885.

SIGNAL OFFICE, Washington, July 1, 1885.

The regular tri-daily cipher weather reports were received during the year over the wires of the Western Union, International Ocean, Florida, Gulf Coast, and Northwestern Telegraph Companies.

One million six hundred and thirty-nine thousand cipher words of weather reports were received at and sent from this office during the year. Seventy thousand two hundred and twenty-five telegrams other than weather reports were sent and received during the same period.

On account of the reduced rates for Government telegrams, including the reports sent over circuits, the service was enabled to largely extend the dissemination of weather reports and forecasts for the benefit of the public.

THE SEA-COAST TELEGRAPH LINES.

The telephone wire from Sandy Hook, New Jersey, to Barnegat Inlet, New Jersey, 52 miles in length, was repaired and the telephone instruments adjusted by Sergeant Bolton during July and August, 1884; the Signal Service furnishing the line material, and the Life Saving Service paying for the hired labor. This section is operated exclusively by the Life Saving Service as a telephone line.

A new single conductor submarine cable, $3\frac{1}{2}$ miles long, was laid across Ocracoke Inlet, North Carolina, on November 29, 1884.

During November and December, 1884, the line between Fort Macon, North Carolina, and Hatteras, North Carolina, 65 miles in length, was repaired and put in as good working order as the available means would permit.

On October 1, 1884, the leased wires connecting this office directly with the sea-coast lines were given up, and since that date all sea-coast telegraphic communications have been transmitted to and from this office over the wires of the Western Union Telegraph Company.

On account of the very limited appropriation for the fiscal year ending June 30, 1885, many badly needed repairs could not be made. At present two-thirds of the entire sea-coast line needs rebuilding.

THE UNITED STATES MILITARY TELEGRAPH LINES.

There have been but few changes in the military telegraph lines, built and operated by the Signal Service, since date of last report.

Lieut. M. P. Maus, First Infantry, was relieved by Lieut. R. B. Watkins, Signal Corps, as officer in charge of the California and Arizona division, on July 31, 1884; and Lieut. W. D. Wright, Signal Corps, was relieved from the charge of the Northwestern Division on May 31, 1885, and ordered to this office. The several detached sections constituting the Northwestern Division are now managed by the chief operators under the direct control of this office, except the Fort Sisseton-Webster line, which was equipped with telephones and turned over to the military authorities at Fort Sisseton.

The aggregate length of the military telegraph lines is now 2,779 miles, against 2,805 miles in operation at the date of the last report.

Only one new line was built during the year—that from Fort Laramie, Wyo., to Fort Robinson, Nebr. It was built by the labor of troops, who also cut the poles for the entire line—75 miles in length. The Signal Service furnished two expert line builders to direct and assist in the work, and all of the line material, which had been recovered from old abandoned lines. The line has worked without interruption since the date of its completion, April 18, 1885.

The abandonment of the military posts at Fort Thornburg, Utah, Fort Cummings, N. Mex., and Fort Craig, N. Mex., rendered the further maintenance of the telegraph lines to those posts unnecessary. The line between Forts Bridger and Thornburg was accord-

ingly abandoned November 15, 1884; that between Fort Cummings and Florida Station, August 22, 1884; and that between San Marcial, via Fort Craig, to Ojo de Analla, March 20, 1885.

To provide a new and shorter outlet for Fort Stanton, N. Mex., than that to San Marcial, a short line was built between Lava, N. Mex., and Ojo de Analla, to connect at the latter point with the line to Fort Stanton. This new line, 10 miles in length, was constructed of iron poles and other material recovered from old abandoned lines, and with the assistance of a detail from Fort Stanton. It was completed March 19, 1885.

All of the abandoned sections were sold at public auction, with the approval of the honorable Secretary of War.

The lines remaining in operation are distributed between the several military departments as follows:

	Miles
Department of Dakota.....	293
Department of the Missouri.....	542
Departments of the Columbia and California.....	512
Department of Arizona.....	510
Department of Texas.....	197
Department of the Platte.....	85
Total.....	2,779

The accompanying map exhibits the various sections of United States military telegraph lines now in operation, and those abandoned during former years.

The following new lines have been recommended built by the respective department commanders, and will be included in the estimates for the next fiscal year, namely:

	Miles
From Fort Gaston, Cal., to the North Fork of Mad River, California.....	25
From Fort Halleck, Nev., to Halleck Station, Nev.....	11
Total.....	40

A new line was also recommended to connect Vancouver Barracks by telephone with Portland, Oreg. The material to build it was supplied by this office, but at last accounts the line had not been built, and it was doubtful whether it would be necessary.

General repairs to sections were made as follows during the year, namely:

Between Fort Apache and Fort Bowie, Ariz., during July and August, 1884. These repairs included the construction of a new iron line between Fort Grant and Wilcox, in place of the old, crooked, wooden line.

Between Fort Stanton and Fort Craig, N. Mex., during September and October, 1884. A large number of iron poles were put up in place of wooden ones; and a sufficient number of iron poles is now on hand to replace the remaining wooden poles on this section.

Between Dayton, Wash., and Fort Lapwai, Idaho, during August and September, 1884. A large number of defective poles were shortened and reset, and the whole line put in thorough repair.

Between Ashland, Oreg., and Fort Bidwell, Cal., during August and September, 1884. Details are now in the field to replace the rotten poles on this section.

All sections in Dakota and Montana were gone over by Lieutenant Wright during the fall of 1884, and general repairs made where needed.

Between Spokane Falls, Wash., and Fort Cœur d'Alene, Idaho, general repairs were made during October, 1884.

Between Brownsville and Rio Grande City, Tex., during October, 1884.

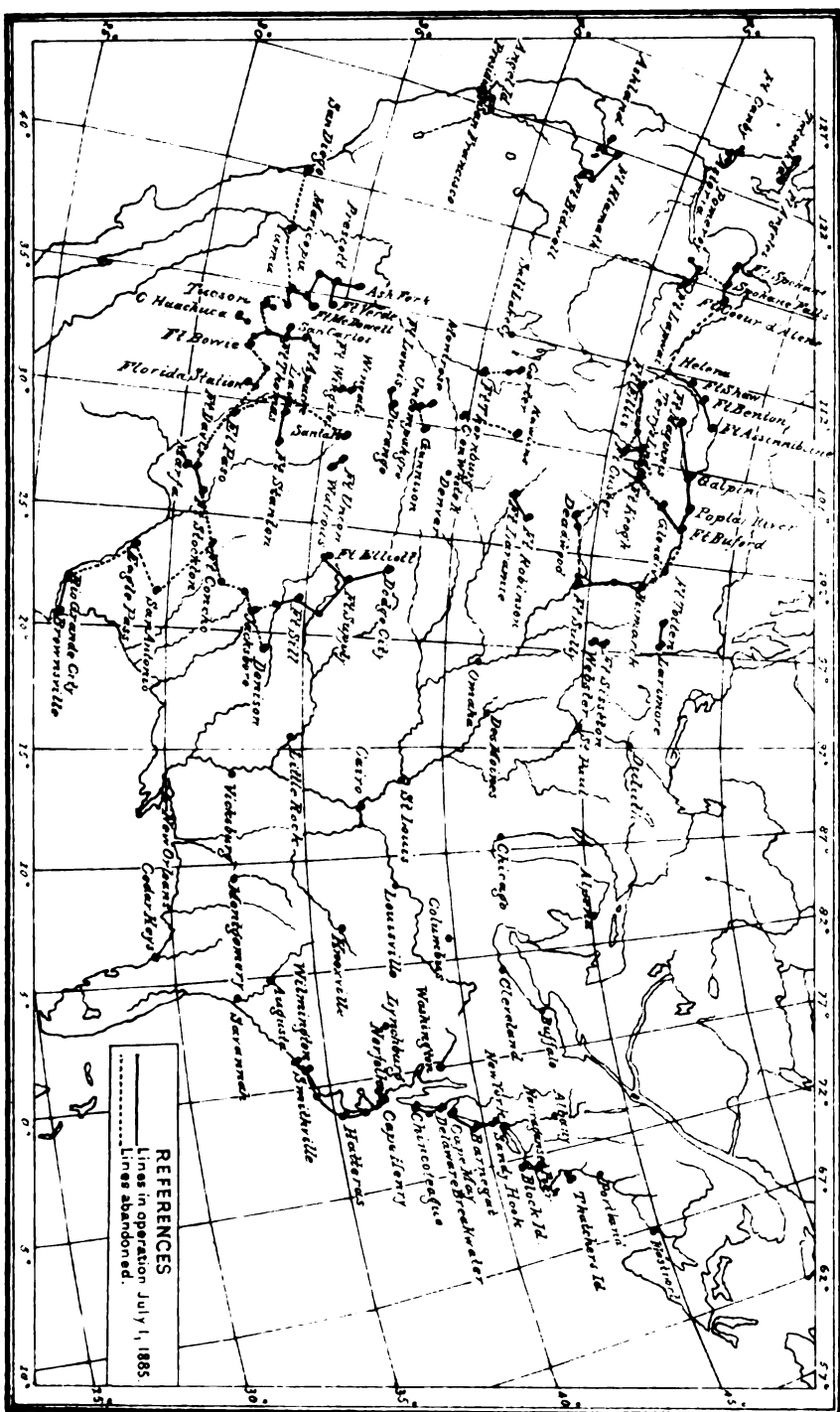
Between Helena and Fort Assinaboine, Mont., during May, 1885.

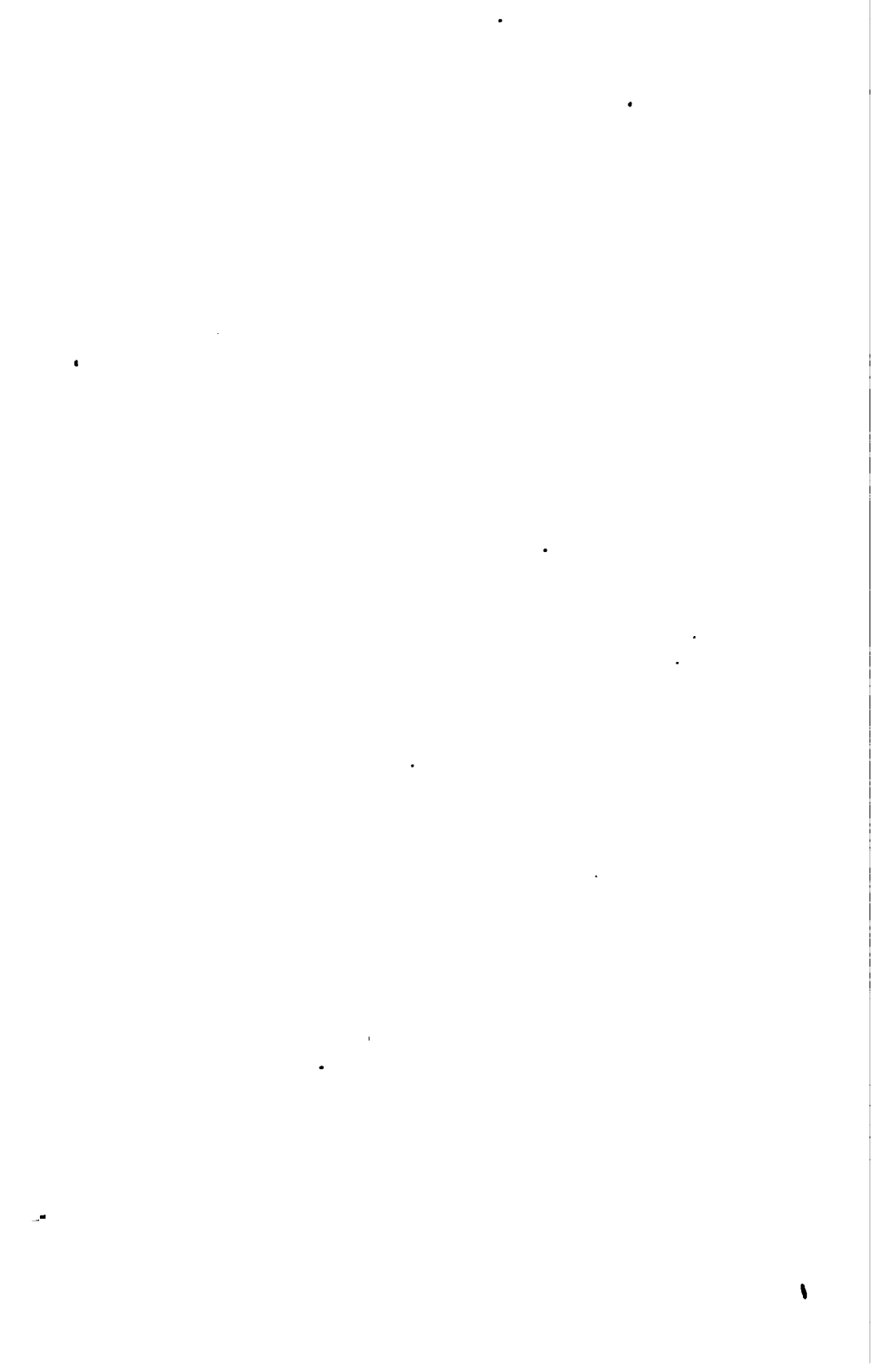
Between Fort Yates and Fort Sully, Dak., during June, 1885.

As the wooden poles on some sections have not been renewed since the lines were first built, a period of from five to eight years, it will be necessary to provide a large number of wooden or iron poles in the near future to replace the poles now rapidly going to decay.

The lines, as a whole, have worked with little more than ordinary interruptions, as all telegraph lines are liable to. Tornadoes, floods, lightning, and malicious interference have been the principal causes of trouble. Considering that these lines run through sparsely-settled regions, where the only means of travel is by horseback, the promptness with which most repairs have been made is commendable. The large measure due to the liberal assistance rendered by most department commanders for whose benefit the lines are maintained. But the men detailed to make general repairs receive no extra compensation for this arduous work.

MAP OF U. S. MILITARY TELEGRAPH LINES.





is neither just nor conducive to that interest in and willingness to perform the work which secure the best results. The recommendation of last year that a law be obtained permitting the permanent detail of fifty enlisted men of the line of the Army for duty with the military lines, and payment of extra-duty pay to the same from line receipts, as in former years, is renewed.

Respectfully submitted.

F. M. M. BEALL,
Second Lieutenant, Signal Corps.

Statement showing the total cash receipts and value of free business on the United States Military telegraph lines during the year ending June 30, 1885.

Division or section.	Cash receipts.		Value of free business.
	This line.	Other lines.	
California and Arizona division.....	\$5,894 98	\$11,143 86	\$7,817 28
Fort Davis section.....	688 19	1,115 20	900 10
Brownsville section.....	1,110 13	615 14	946 84
Fort Stanton section.....	335 89	676 08	87 20
Indian Territory section.....	1,557 95	1,886 48	2,606 45
Fort Bridger section.....	96 77	166 24	87 14
Fort Robinson section*.....	39 24	99 45	59 47
Fort Canby section.....	97 84	95 27	1,645 71
Cape Flattery section.....	111 84	318 89	2,006 57
Fort Klamath section.....	567 11	734 31	333 91
Dayton section.....	874 25	947 36	222 57
Spokane Falls section.....	436 68	383 72	681 41
Fort Maginnis section.....	317 77	1,080 28	1,516 09
Fort Assinaboine section.....	1,430 83	2,056 58	1,237 27
Fort Custer section.....	100 45	448 75	539 09
Fort Bismarck section.....	255 74	482 82	910 96
Fort Totten section.....	24 82	134 77	79 08
Total.....	13,939 47	22,384 70	21,737 14

* For two and one-half months.

APPENDIX 64.

REPORT OF OFFICER IN CHARGE OF CORRESPONDENCE AND RECORDS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, August 15, 1885.

SIR: I have the honor to inclose herewith, as usually furnished by the Correspondence and Records Division, for publication in annual reports, the following, in duplicate in each case:

- (1) List showing number of communications sent from and received at the Signal Office, Washington City (exclusive of telegrams), year ending June 30, 1885.
- (2) List of stations inspected year ending June 30, 1885.
- (3) List of places for which stations have been requested, but not established to June 30, 1885.
- (4) List showing meteorological data furnished persons for purpose specified, year ending June 30, 1885.
- (5) List of boards of trade, chambers of commerce, and other organizations having meteorological committees to confer with the Chief Signal Officer, June 30, 1885.

Very respectfully, your obedient servant,

B. M. PURSELL,

Second Lieutenant, Signal Corps, United States Army.

The CHIEF SIGNAL OFFICER, United States Army.

APPENDIX 64 A.

Communications sent from and received at the Signal Office, Washington City (exclusive of telegrams), from July 1, 1884, to June 30, 1885.

SENT.

To heads of Departments and Bureaus	3,932
To non-commissioned officers in charge of stations concerning their duties	14,110
In reply to applications for establishment of stations	116
To telegraph companies in reference to transmission of weather reports, the erection of telegraph lines, &c.	145
To boards of trade, chambers of commerce, &c.	235
To foreign correspondents relating to simultaneous weather reports	267
To foreign correspondents in general	1,061
To voluntary observers throughout the United States	5,725
Relative to enlistments, discharges, &c.	1,141
Relative to publications	1,328
Data furnished	294
To postmasters relative to Farmer's Bulletins, &c.	196
To railroad companies relative to establishing stations, furnishing indications, &c.	216
To Fort Myer, Virginia, concerning duties and discipline at Signal Service school of instruction	226
Relative to furnishing meteorological instruments, charts, books, forms, &c.	472
Relative to building, sale, repair, &c., of telegraph lines	133
To signal officers relative to their duties	409
Orders, circulars, instructions, &c.	42,601
To manufacturers and others in reference to instruments, equipments, &c.	9,072
To enlisted men in reference to property and money accounts	12,061
In reference to quarterly returns of officers, &c.	3,174
Authorizing purchases and expenditures	2,372
Miscellaneous	8,920
Total	108,522

RECEIVED.

From heads of Departments and Bureaus.....	6, 938
Applications for establishment of new stations.....	35
From telegraph companies in reference to the transmission of weather reports and the construction of telegraph lines, &c.....	183
From boards of trade, chambers of commerce, &c.....	289
From foreign correspondents.....	7, 099
Surgeons' certificates.....	670
Examination papers.....	133
From enlisted men in reference to their duties.....	10, 516
Returns, accounts, descriptive lists, &c.....	1, 301
From United States naval stations and vessels.....	1, 932
From voluntary observers throughout the United States.....	3, 991
From United States military posts (surgeons' reports).....	574
Relating to duties and discipline at Signal Service school of instruction at Fort Myer, Virginia.....	251
Relating to instruction in military signaling.....	77
Applications for enlistment.....	574
Instruction reports.....	2, 167
Reports from railroad stations in reference to weather reports.....	20, 507
Meteorological forms, &c., from stations.....	213, 182
Reports from postmasters in reference to weather bulletins.....	103, 952
Acknowledgments of orders, circulars, &c.....	17, 000
From manufacturers and others in reference to instruments, equipments, &c.....	5, 253
From officers concerning property, quarterly returns, &c.....	5, 856
From enlisted men relating to property and money accounts.....	24, 917
Miscellaneous.....	10, 730
Total.....	438, 127
Total sent.....	108, 582
Total sent and received.....	546, 709

TELEGRAMS.

Cipher words of weather reports sent and received.....	1, 639, 000
Telegrams other than weather reports sent and received.....	70, 225

APPENDIX 64 B.

Stations inspected year ending June 30, 1885.

Station.	Inspected by—	Date of inspection.
Albany, N. Y.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	March 29, 30, 1885.
Alpena, Mich.....	do.....	April 24, 1885.
Apache, Fort, Ariz.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	November 11, 12, 1884.
Assinaboine, Fort, Mont.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	November 11, 12, 1884.
Atlanta, Ga.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	March 20, 21, 1885.
Augusta, Ga.....	do.....	March 22, 23, 1885.
Baltimore, Md.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	March 9, 10, 1885.
Bennett, Fort, Dak.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	September 28, 1884.
Benton, Fort, Mont.....	do.....	November 9, 1884.
Bidwell, Fort, Cal.....	Lieut. Frank Greene, Signal Corps, U. S. A.....	July 17, 1884.
Bismarck, Dak.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	January 6-8, 1885.
Block Island, R. I.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	March 12, 13, 1885.
Boise City, Idaho.....	Lieut. Frank Greene, Signal Corps, U. S. A.....	July 14, 1884.
Bowie, Fort, Ariz.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	October 24, 1884.
Boston, Mass.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	March 15-19, 1885.
Buffalo, N. Y.....	do.....	April 8, 9, 1885.
Brownsville, Tex.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	March 14, 15, 1885.
Buford, Fort, Dak.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	October 13, 1884.
Burlington, Iowa.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	May 7, 8, 1885.
Cape Mendocino, Cal.....	Lieut. Frank Greene, Signal Corps, U. S. A.....	July 29-31, 1884.
Cape Henry, Va.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	March 5, 6, 1885.
Cairo, Ill.....	do.....	May 8, 9, 1885.
Cape Lookout, N. C.....	do.....	May 27, 28, 1885.

Stations inspected year ending June 30, 1885—Continued.

Station.	Inspected by—	Date of inspection.
Cedar Keys, Fla.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	April 1-3, 1885.
Charlotte, N. C.....	do.....	March 17, 18, 1885.
Chattanooga, Tenn.....	do.....	May 12, 13, 1885.
Cheyenne, Wyo.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	April 20-23, 1885.
Chicago, Ill.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	May 11-13, 1885.
Charleston, S. C.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	March 24-26, 1885.
Cincinnati, Ohio.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	March 18, 19, 1885.
Cleveland, Ohio.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	April 11-18, 1885.
Concho, Fort, Tex.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	February 13-15, 1885.
Custer, Fort, Ariz.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	October 30, 31, 1884.
Columbus, Ohio.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	March 15-17, 1885.
Colorado Springs, Colo.....	do.....	April 10-17, 1885.
Craig, Fort, N. Mex.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	November 2, 1884.
Davis, Fort, Tex., and Marfa.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	February 23-27, 1885.
Davenport, Iowa.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	May 2-4, 1885.
Deadwood, Dak.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	October 6, 1884.
Des Moines, Iowa.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	April 30 to May 2, 1885.
Detroit, Mich.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	April 16, 17, 1885.
Denver, Colo.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	April 17-20, 1885.
Dodge City, Kans.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	April 27, 28, 1885.
Dubuque, Iowa.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	May 5-7, 1885.
Duluth, Minn.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	May 7, 8, 1885.
El Paso, Tex.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	February 5-10, 1885.
Erie, Pa.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	April 10, 1885.
Escanaba, Mich.....	do.....	May 1, 2, 1885.
Elliot, Fort, Tex.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	April 22, 23, 1885.
Glendive, Mont.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	October 10, 1884.
Grant, Fort, Ariz.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	October 25, 26, 1884.
Greencastle, Ind.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	March 24, 25, 1885.
Galveston, Tex.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	March 26-28, 1885.
Grand Haven, Mich.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	May 14, 1885.
Helena, Mont.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	November 3-19, 1884.
Huron, Dak.....	do.....	December 16, 17, 1884.
Hatteras, N. C.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	May 23-25, 1885.
Indianapolis, Ind.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	March 22-24, 1885.
Indianola, Tex.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	March 23-24, 1885.
Jacksonville, Fla.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	March 29-31, 1885.
Key West, Fla.....	do.....	April 9-11, 1885.
Keokuk, Iowa.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	May 8-10, 1885.
Knoxville, Tenn.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	May 14, 15, 1885.
Kitty Hawk, N. C.....	do.....	May 20, 21, 1885.
Los Angeles, Cal.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	October 1, 2, 1884.
Louisville, Ky.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	March 19-21, 1885.
Leavenworth, Kans.....	do.....	March 30, April 1-3, 1885.
Lamar, Mo.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	May 1, 2, 1885.
La Crosse, Wis.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	May 5, 1885.
Little Rock, Ark.....	Lieut. W. A. Glassford, Signal Corps, U. S. A.....	May 7-9, 1885.
Lynchburg, Va.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	May 16, 17, 1885.
Maricopa, Ariz.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	September 28, 1884.
McDowell Fort, Ariz.....	do.....	September 28, 1884.
Magginnis Fort, Mont.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	October 24-26, 1884.
Moorhead, Minn.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	December 2, 3, 1884.
Mount Washington, N. H.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	March 23, 23, 1885.
Montgomery, Ala.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	April 19-21, 1885.
Mobile, Ala.....	do.....	April 22-24, 1885.
Mackinaw City, Mich.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	April 28, 1885.
Marquette, Mich.....	do.....	April 30, May 1, 1885.
Milwaukee, Wis.....	do.....	May 3, 4, 1885.
Memphis, Tenn.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	May 5-7, 1885.
Macon, Fort, N. C.....	do.....	May 28, 29, 1885.
New York City.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	March 3-5, 1885.
Norfolk, Va.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	March 3, 4, 1885.
New Haven, Conn.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	March 7-9, 1885.
New London, Conn.....	do.....	March 9, 10, 1885.
Narragansett Pier, R. I.....	do.....	March 11, 1885.
New River Inlet, N. C.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	March 12-14, 1885.
North Platte, Nebr.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	April 25-27, 1885.
New Orleans, La.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	April 25-28, 1885.
New Orleans, La. (exposition building).....	do.....	April 29, 30, 1885.
Nashville, Tenn.....	do.....	May 10, 11, 1885.
Oswego, N. Y.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	March 31, April 1, 1885.
Omaha, Nebr.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	April 25-30, 1885.
Poplar River, Mont.....	Lieut. W. D. Wright, Signal Corps, U. S. A.....	October 13, 1884.
Phoenix, Ariz.....	Lieut. R. B. Watkins, Signal Corps, U. S. A.....	September 28, 1884.
Prescott, Ariz.....	do.....	November 21, 22, 1884.
Point Judith, R. I.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	March 11, 1885.
Pittsburg, Pa.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	March 12, 13, 1885.
Portland, Me.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	March 26, 27, 1885.
Pensacola, Fla.....	Lieut. J. C. Walshe, Signal Corps, U. S. A.....	April 16, 17, 1885.
Fort Huron, Mich.....	Lieut. F. R. Day, Signal Corps, U. S. A.....	April 20, 21, 1885.
Pike's Peak, Colo.....	Lieut. J. P. Finley, Signal Corps, U. S. A.....	April 10-17, 1885.

Stations inspected year ending June 30, 1885—Continued.

Station.	Inspected by—	Date of inspection.
Portsmouth, N. C.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	May 25, 26, 1885.
Palestine, Tex.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	March 30, 31, 1885.
Red Bluff, Cal.	Lieut. Frank Greene, Signal Corps, U. S. A.	August 5-7, 1884.
Rio Grande City, Tex.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	March 11, 12, 1885.
Rochester, N. Y.	Lieut. F. R. Day, Signal Corps, U. S. A.	April 2, 3, 1885.
Reno, Fort, Ind. T.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	April 13, 14, 1885.
Salt Lake City, Utah.	Lieut. Frank Greene, Signal Corps, U. S. A.	July 9-11, 1884.
Sacramento, Cal.	do.	July 21, 22, 1884.
Sully, Fort, Dak.	Lieut. W. D. Wright, Signal Corps, U. S. A.	September 26, 1884.
San Diego, Cal.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	October 3, 1884.
San Carlos, Ariz.	do.	October 29, 1884.
San Marcial N. Mex.	do.	November 2, 1884.
Stanton, Fort, N. Mex.	do.	November 5, 6, 1885.
Shaw, Fort, Mont.	Lieut. W. D. Wright, Signal Corps, U. S. A.	November 7, 1884.
Saint Vincent, Miss.	do.	December 4, 5, 1884.
Sisseton, Fort, Dak.	do.	December 14, 1884.
Santa Fé, N. Mex.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	January 30, 31, February 1, 2, 1885.
Stockton, Fort, Tex.	do.	February 19-21, 1885.
Smithville, N. C.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	March 9, 10, 1885.
San Antonio, Tex.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	March 3-6, 1885.
Scott's Hill, N. C.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	March 11, 12, 1885.
Saint Louis, Mo.	Lieut. J. P. Finley, Signal Corps, U. S. A.	March 26-29, 1885.
Savannah, Ga.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	March 27-29, 1885.
Shreveport, La.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	April 2, 3, 1885.
Sanford, Fla.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	April 5, 6, 1885.
Sill, Fort, Ind. T.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	April 7-9, 1885.
Sandusky, Ohio.	Lieut. F. R. Day, Signal Corps, U. S. A.	April 13, 14, 1885.
Supply, Fort, Ind. T.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	April 20, 1885.
Saint Paul, Minn.	Lieut. F. R. Day, Signal Corps, U. S. A.	May 6, 1885.
Smith, Fort, Ark.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	May 5, 6, 1885.
Springfield, Ill.	Lieut. J. P. Finley, Signal Corps, U. S. A.	May 12-14, 1885.
Terry's Landing, Mont.	Lieut. W. D. Wright, Signal Corps, U. S. A.	October 21, 1884.
Thomas, Fort, Ariz.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	October 27, 28, 1884.
Totten, Fort, Dak.	Lieut. W. D. Wright, Signal Corps, U. S. A.	December 8, 1884.
Toledo, Ohio.	Lieut. F. R. Day, Signal Corps, U. S. A.	April 14, 15, 1885.
Verde, Fort, Ariz.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	September 22, 1884.
Vicksburg, Miss.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	May 2-4, 1885.
Wickenburg, Ariz.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	September 25, 1884.
Willcox, Ariz.	do.	October 23, 1884.
Watrous, N. Mex.	Lieut. W. A. Glassford, Signal Corps, U. S. A.	January 27, 1885.
Wilmington, N. C.	Lieut. J. C. Walshe, Signal Corps, U. S. A.	March 7-9, 1885.
West Las Animas, Colo.	Lieut. J. P. Finley, Signal Corps, U. S. A.	April 7-10, 1885.
Yates, Fort, Dak.	Lieut. W. D. Wright, Signal Corps, U. S. A.	September 15, 1884.
Yuma, Fort, Ariz.	Lieut. R. B. Watkins, Signal Corps, U. S. A.	September 29-30, 1884.
Yankton, Dak.	Lieut. W. D. Wright, Signal Corps, U. S. A.	December 19, 1884.

APPENDIX 64 C.

List of places for which stations have been requested but not established to June 30, 1885.

Place.	Date.	Place.	Date.
Alabama:		California:	
Auburn (Agricultural and Mechanical College).	May 14, 1872	Bakersfield.	May 14, 1874
	Dec. 23, 1880	Cheyenne Wells.	July 27, 1877
	Jan. 4, 1881	Oakland (University of California).	Mar. 12, 1881
Coffeeville.	Dec. 20, 1882		Apr. 15, 1884
Eataw.	July 20, 1872		Apr. 5, 1885
Florence.	Apr. 20, 1880	Table Mountain.	Oct. 4, 1883
Friendville.	Nov. 6, 1875	Tulose.	June 29, 1884
Marion.	Oct. 16, 1881	Wilmington.	Jan. 4, 1881
Trinity.	Mar. 4, 1882	Colorado:	
Arkansas:		Fountain.	Dec. 4, 1871
Fayetteville (Arkansas Industrial University).	Feb. 17, 1874	Leadville.	June 17, 1880
	Sept. 28, 1881		Feb. 9, 1881
Fulton.	Dec. 23, 1875	Mount Massive.	Feb. 23, 1882
	Dec. 21, 1879	Summit.	Jan. 7, 1880
Hot Springs.	Aug. 2, 1881	The Parks of Colorado.	May 24, 1871
	Dec. 10, 1877	Connecticut:	
Indsonia University.	Aug. 18, 1877	Hartford.	Jan. 21, 1875
	July 6, 1878	Mohawk Mountain.	Oct. 14, 1882
		Race Rock Light-house.	Nov. 20, 1880

List of places for which stations have been requested, &c.—Continued.

Place.	Date.	Place.	Date.
Connecticut—Continued.		Iowa—Continued.	
The National Park.....	Nov. 7, 1880	Fort Dodge.....	Nov. 4, 1873
Yale College.....	Jan. 30, 1885	Iowa City (State University).....	Dec. 14, 1871
Dakota:			Jan. 6, 1873
Aberdeen.....	Feb. 18, 1882		Jan. 3, 1873
Chamberlain.....	June 22, 1882	Mason City.....	Oct. 6, 1871
	July 17, 1882		Dec. 11, 1882
	Nov. 15, 1882	Monticello.....	Apr. 15, 1877
Lisbon.....	Nov. 16, 1882	Sheldon.....	July 18, 1881
Pierre.....	Jan. 5, 1883	Sioux City.....	July 18, 1881
Randall, Fort.....	Nov. 9, 1871	Spirit Lake.....	June 6, 1883
Richardson.....	Dec. 6, 1883	Kansas:	
Thompson, Fort.....	June 18, 1874	Ellsworth.....	July 14, 1874
Young Man's Butte.....	Dec. 6, 1883		July 21, 1874
Delaware:			Mar. 6, 1873
Newark (Delaware College).....	Jan. 11, 1872	Emporia (State Normal School).....	Feb. 2, 1881
Ocean View.....	Apr. 16, 1884	Gaylord.....	Dec. 27, 1879
Wilmington.....	June 24, 1872	Grainfield.....	Mar. 3, 1882
Florida:		Holton.....	Sept. 25, 1884
Apalachicola.....	Sept. 10, 1883	Lawrence (University of Kansas).....	Jan. 16, 1873
Fort Jupiter Light.....	Dec. 27, 1881		May 6, 1873
	Dec. 31, 1881		Jan. 7, 1881
	June 14, 1882	On plains of Western Kansas and regions to southward and westward.....	Dec. 21, 1872
Lawtey.....	Oct. 27, 1882		
Palatka.....	Feb. 4, 1882	Salina.....	July 17, 1873
Tallahassee.....	Jan. 12, 1875		Apr. 2, 1877
Three or four additional stations in the interior of the State.....	May 6, 1875	Sherlock.....	July 9, 1884
		Towanda.....	Feb. 12, 1872
Titusville.....	No date.	Wichita.....	July 12, 1882
Georgia:		Kentucky:	
Doboy Island.....	Jan. 25, 1879	Anchorage.....	Mar. 31, 1877
New Switzerland.....	Feb. 3, 1882	Carrollton.....	Mar. 6, 1881
Rome.....	Apr. 24, 1874	Central University, Richmond.....	Sept. 11, 1885
	Jan. 21, 1875	Lexington.....	Apr. 22, 1882
	Dec. 4, 1873		May 13, 1883
	Mar. 31, 1876	Richmond.....	Apr. 22, 1884
	Mar. 16, 1877	Louisiana:	
	July 19, 1878	Balize.....	Oct. 31, 1871
Idaho:		Baton Rouge (State University and Agricultural and Mechanical College).....	Feb. 23, 1881
Franklin.....	July 23, 1875		
Silver City.....	Feb. 9, 1876	Lake Charles.....	June 12, 1873
Illinois:			Oct. 15, 1877
Abingdon (Abingdon College).....	Apr. 1, 1875	Southwest Pass (Pass à l'Outre).....	Mar. 20, 1871
Bloomington.....	Aug. 30, 1874	Maine:	
Carbondale (Southern Illinois Normal University).....	Oct. 1, 1878	Augusta (United States arsenal).....	Feb. 16, 1883
		Belfast.....	Aug. 6, 1872
	Oct. 2, 1878	Calais.....	June 16, 1874
Carthage.....	Sept. 2, 1872	Crumplie Island.....	Dec. 4, 1881
Decatur.....	Aug. 30, 1874		Dec. 10, 1881
Galena.....	Sept. 14, 1871		Feb. 8, 1884
Grand Tower.....	Mar. 21, 1872	Cutler.....	Apr. 3, 1882
Grayville.....	June 7, 1878	Green Mountain.....	Sept. 21, 1882
Jacksonville.....	Mar. 15, 1873	Orono (State Agricultural College).....	Oct. 19, 1871
Metamora.....	Aug. 8, 1871		Feb. 17, 1873
Pana.....	Jan. 17, 1875	Penobscot Bay (entrance).....	Jan. 19, 1882
Princeton.....	Aug. 11, 1871	White Head.....	Feb. 28, 1881
Peoria.....	Dec. 22, 1884	Maryland:	
Quincy.....	Jan. 4, 1872	State Agricultural College.....	Apr. 18, 1872
	July 25, 1879		June 21, 1882
	Dec. 3, 1879	Annapolis.....	July 28, 1884
	Jan. 7, 1885	Massachusetts:	
Sandwich.....	Jan. 22, 1873	Amherst (State Agricultural College).....	Mar. 30, 1878
Indiana:		Nantucket.....	Mar. 6, 1881
Crawfordsville (Wabash College).....	June 6, 1874	Pittsfield.....	Dec. 20, 1882
		South Framingham.....	Apr. 18, 1881
Evansville.....	Dec. 2, 1884	State arsenal.....	July 22, 1881
Fort Wayne.....	Apr. 12, 1872		Aug. 22, 1881
Lafayette (Purdue University).....	Apr. 14, 1879	Vineyard Haven.....	Dec. 18, 1871
Leavenworth.....	Oct. 13, 1882	Michigan:	
New Albany.....	Apr. 12, 1872	Ann Arbor (University of Michigan).....	Nov. 25, 1871
Nobleville.....	July 27, 1883		
Richmond.....	Aug. 20, 1881	Eagle River.....	Jan. 21, 1882
Rockville.....	Dec. 8, 1883	Glen Haven.....	June 11, 1881
Vincennes.....	June 15, 1873		Dec. 4, 1881
Iowa:			Mar. 4, 1882
Afton.....	Feb. 17, 1875	Hillsdale.....	Aug. 6, 1871
Algona.....	Feb. 14, 1878	Huron City.....	Jan. 27, 1871
Ames (State Agricultural College).....	Jan. 23, 1878		Feb. 19, 1871
Cedar Rapids.....	Feb. 11, 1881		
Council Bluffs.....	Mar. 9, 1885		

List of places for which stations have been requested, &c.—Continued.

Place.	Date.	Place.	Date.
Michigan—Continued.		New Mexico:	
Lansing (State Agricultural College).	Jan. 12, 1875	Cimarron.....	Dec. 3, 1880
Leland.....	Dec. 18, 1883	New York:	
Manitou Island.....	Dec. 22, 1884	Alfred Centre (Alfred University).	Jan. 12, 1877
Niles.....	Feb. 25, 1882	Catskill Mountains.....	June 21, 1883
Paw-Paw.....	Oct. 24, 1881	Deposit.....	Apr. 1, 1872
Port Hope.....	July 27, 1881	Ithaca (Cornell University).....	Aug. 8, 1872
Three Rivers.....	Apr. 8, 1876		Nov. 18, 1872
White Hall.....	July 22, 1871		Nov. 22, 1872
	May 30, 1873		Jan. 25, 1873
	Mar. 29, 1879		Jan. 3, 1875
	Oct. 6, 1879		Mar. 17, 1875
Minnesota:			Apr. 17, 1875
Breckinridge.....	Feb. 17, 1881		May 7, 1878
Detroit.....	Feb. 2, 1873		Aug. 8, 1878
Minneapolis (University of Minnesota).	Feb. 21, 1872		Oct. 16, 1880
Minneapolis.....	Mar. 16, 1885	Long Beach (Long Island).....	May 25, 1872
New Ulm.....	July 10, 1872	Ogdensburg.....	Mar. 7, 1879
	Dec. 15, 1881	Overlook Mountains.....	May 28, 1872
Northfield (Carleton College).....	May 23, 1879	Plattsburg.....	Nov. 8, 1881
	Nov. 19, 1880	Port Jervis.....	Aug. 23, 1884
	June 25, 1877	Saratoga Springs.....	Feb. 14, 1883
Mississippi:		Sodus Point.....	Aug. 8, 1878
Chatawa (College of the Redemptionist Fathers).	July 13, 1874	Starkey.....	June 9, 1871
Iuka.....	Mar. 25, 1872	Staten Island.....	June 20, 1871
Macon.....	Jan. 9, 1881		May 14, 1880
Starkville.....	June 25, 1884	Suspension Bridge (Seminary of our Lady of Angels).	May 9, 1874
Winona.....	July 20, 1882	Syracuse.....	May 11, 1874
Agricultural and Mechanical College.	June 19, 1885	The Vista (Catskill Mountains).	Feb. 6, 1878
Missouri:		Ticonderoga.....	Feb. 21, 1882
Brunswick.....	June 4, 1885	Watertown.....	June 21, 1871
Carthage.....	Aug. 15, 1873		June 21, 1873
Dromore.....	Jan. 27, 1883		Mar. 9, 1876
Glasgow.....	Mar. 8, 1880	Whitestone (Long Island).....	Dec. 29, 1881
Killingham.....	Mar. 21, 1884	North Carolina:	
Louisiana.....	Aug. 31, 1871	Alleghany Mountains.....	July 26, 1873
	Jan. 4, 1882	Asheville.....	May 13, 1885
Mason City.....	Mar. 30, 1874	Beaufort.....	Feb. 15, 1881
Pierce City.....	Apr. 9, 1873		Feb. 15, 1881
	Nov. 10, 1880		July 24, 1882
	Feb. 17, 1885	Black Dome (Black Mountains).	Feb. 12, 1872
Rolla (Missouri School of Mines).	May 5, 1880		Dec. 10, 1880
Saint Joseph (University of Missouri).	July 17, 1876		Jan. 28, 1881
	Jan. 22, 1882	Body Island.....	Apr. 17, 1871
	Mar. 15, 1883	Chadbourne.....	July 4, 1883
Saint Louis (College of the Christian Brothers).	Mar. 12, 1884	Danville (Mocksville and South-western Railroad).	July 29, 1881
Springfield.....	Feb. 9, 1884	Great Natchalee (Bald Mountains).	Apr. 1, 1872
West Plains.....	Aug. —, 1884	Hibriten Mountains.....	Jan. 28, 1881
Montana:		Highlands.....	Dec. 13, 1881
Bedford.....	Apr. 10, 1881		Dec. 29, 1881
Butte.....	Oct. 11, 1879		Dec. 30, 1881
Etchetah.....	Oct. 21, 1881		Feb. 12, 1884
Livingston.....	Mar. 15, 1883	Lenoir.....	July 23, 1875
Missoula.....	June 26, 1882	Mount Mitchell.....	Aug. 29, 1879
Wolf Point.....	June 16, 1882	Mount Stookey.....	Oct. 19, 1882
Nebraska:		Ocracoke.....	June 29, 1877
Beatrice.....	Mar. 3, 1874	Roane Mountain.....	July 19, 1878
Columbus.....	Sept. 5, 1871	Smead's Ferry.....	Mar. 14, 1885
Fairbury.....	May 12, 1876	Statesville.....	Nov. 17, 1877
Lincoln.....	Mar. 4, 1884		Jan. 29, 1879
Nebraska City.....	Aug. 14, 1874	Swansborough.....	Sept. 4, 1879
Nevada:		Winston.....	Mar. 17, 1880
Carson City.....	Mar. 6, 1876	Ohio:	
New Jersey:		Dayton (National Soldiers' Home).	Feb. 11, 1873
Camden (The River Iron Works).	July 29, 1874		Feb. 1, 1875
Neshanic Mountains (Somerset County).	Apr. 12, 1873	Gallipolis.....	Feb. 10, 1885
Somerset County (latitude, 40° 30'; longitude 74° 42').	Dec. 22, 1873	Hillsborough.....	Sept. 3, 1881
New Hampshire:		Ironton.....	Mar. 25, 1875
Dover Point.....	Jan. 13, 1872	Kelly's Island.....	May 25, 1876
Gorham.....	Mar. 30, 1874		Dec. 17, 1879
Isles of Shoals.....	Sept. 10, 1879		Aug. 19, 1880
Manchester.....	Jan. 21, 1873	Oxford.....	Feb. 22, 1882
Milton.....	Jan. 8, 1883		Aug. 5, 1882
Mount Kearsarge.....	Oct. 28, 1874	Springfield.....	Feb. 7, 1881
Mount Massilank.....	Aug. 16, 1871	University of Ohio, Columbus.....	June 23, 1885
		Xenia.....	June 30, 1871
		Yellow Springs.....	Feb. 4, 1885

APPENDIX 64 D.

Meteorological data were furnished 208 different persons during the year ending June 30, 1885, at their request, for the following purposes, viz:

To be used in State or United States courts as evidence.

To be used in compiling works or publications on meteorology, hygiene, agriculture, manufactures, commerce, &c.

To assist in manufactures, the prosecution of the arts, and advancement of the sciences.

To settle questions as to the relations of meteorology and agriculture.

In deciding the cause and locating the responsibility in railroad and marine disasters.

In fixing the responsibility of damage to freight in transit by common carriers.

In acquainting immigrants with the climatology of districts open to settlement.

In informing invalids of the desirability of the meteorology of sections affecting their diseases.

Miscellaneous purposes.

APPENDIX 64 E.

List of boards of trade, chambers of commerce, and other organizations which had on June 30, 1885, meteorological committees to confer with the Chief Signal Officer of the Army.

Place.	Name of organization.	Committee.
Albany, N. Y	Board of Trade.....	Charles B. Tillinghast, J. Townsend Lansing, Walter McEwan.
Alpens, Mich.....	Board of Underwriters.....	Henry S. Seage, John N. Kelley, J. D. Holmes, B. F. Luce, Charles H. Luce.
Astoria, Oreg.....	Chamber of Commerce.....	Dr. A. C. Kinney.
Atlanta, Ga.....	Board of Trade and Academy of Science.	B. W. Fobel, J. T. Henderson, R. J. Redding.
Augusta, Ga.....	Cotton Exchange.....	G. W. Crane, J. M. Anderson, J. J. Dicks.
Baltimore, Md.....	Board of Trade.....	George J. Appold, D. L. Bartlett, Germon H. Hunt, Frank H. Jenkins, D. T. Buzby.
Block Island, R. I.....	.....	B. B. Mitchell, Ray S. Littlefield, Charles E. Perry.
Boston, Mass.....	Society of Arts.....	Prof. William H. Niles, Jacob A. Dresser, George L. Roberts.
Buffalo, N. Y	Merchants' Exchange.....	Nathan C. Simons, Frank W. Fliske, Charles H. Arthur.
Charleston, S. C.....	Chamber of Commerce.....	C. Gravely, F. W. Dawson, A. D. Cohen.
Do.....	Merchants' Exchange.....	George W. Bell, T. Follett Ware, John Dougherty.
Charlotte, N. C.....	Chamber of Commerce.....	T. F. Drayton, S. A. Cohen, W. W. Fleming.
Chattanooga, Tenn.....	Iron, Coal, and Manufacturers' Association.	D. W. Chase, J. F. Bennett, A. M. Johnson, S. R. Read, C. E. James, T. A. Snow, G. G. Moore.
Chicago, Ill.....	Board of Trade.....	W. S. Seavers, W. D. Gregory.
Cincinnati, Ohio.....	Board of Trade and Transportation Committee.	T. E. Livezey, George C. Clements, Charles H. Law, Alexander Hill, A. M. Dolph.
Cleveland, Ohio.....	Board of Trade.....	R. T. Lyon, Capt. W. B. Guyles, R. K. Winslow.
Columbus, Ohio.....	Board of Trade.....	George W. Twiss, George Cole, J. B. K. Conelly.
Concordia, Kans.....	.....	B. H. McEckron, Theo. Laing, Prof. T. A. Sawhill.
Denver, Colo.....	Chamber of Commerce.....	Charles F. Wilson, Ed. L. Scholtz, J. B. Reverdy, Samuel A. Fisk, M. D.; L. E. Lemon, M. D.; J. H. Kimball.
Des Moines, Iowa.....	Board of Trade.....	J. P. Bushnell, secretary; S. A. Robertson, W. A. Warfield.
Detroit, Mich.....	Board of Trade.....	T. P. Hall, J. W. Flynn.
Dubuque, Iowa.....	Board of Trade.....	Dr. A. Horr, T. W. Ruete, S. M. Langworthy.
Duluth, Minn.....	Board of Trade.....	Walter Van Brunt, Owen Fargueson, Benj. R. Clarkson.
Erie, Pa.....	Board of Trade.....	H. S. Jones, Jos. Johnston, Charles Jarecki.
Grand Haven, Mich.....	.....	Hon. Dwight Cutler, T. W. Kirby, William Wallace.
Huron, Dak.....	Board of Trade.....	John Cain, Augustine Davis, Hon. Geo. W. Sterling.
Indianapolis, Ind.....	Board of Trade.....	George W. Sloan, A. J. Halford, James R. Carnehan.
Indianola, Tex.....	Board of Trade.....	H. J. Huck, Emile Reiffert.

List of boards of trade, chambers of commerce, and other organizations, &c.—Continued.

Place.	Name of organization.	Committee.
Jacksonville, Fla.....	Jacksonville Board of Trade.	Dr. A. S. Baldwin, Reed, Clark, Bower, Fuerlie.
La Crosse, Wis.....	Board of Trade.....	D. A. McDonald, John Rau, J. H. Sherman.
Leavenworth, Kans.....	Board of Trade.....	Dr. R. J. Brown, Judge L. Hawn, L. Mayo.
Los Angeles, Cal.....	Los Angeles Board of Trade.	Eugene Germain, Vinton L. Mitchell, W. A. Clinton.
Louisville, Ky.....	Board of Trade.....	William Cornwall, jr., J. B. Speed, Graham Wilder, J. A. Tanner, E. H. Bowen, Nick Finzer, R. M. Kelly.
Do.....	Polytechnic Society.....	E. A. Grant, M. D., L. D.; Prof. J. A. Tanner, M. D.; Prof. H. W. Eaton, Ph. D.
Lynchburg, Va.....	Chamber of Commerce.....	R. H. T. Adams, Joseph Cohn, William Hunt.
Memphis, Tenn.....	Cotton Exchange.....	D. P. Hadden, John D. Milburn, J. J. Freeman, H. A. Hamilton, M. Gavin, James Yonge, L. A. Scarbrough, A. A. Paton, John Overlon, jr., B. J. Semmes.
Do.....	Merchants' Exchange.....	A. J. Livermore, J. F. Frank, A. D. Langstaff.
Milwaukee, Wis.....	Milwaukee Chamber of Commerce.	John L. Hathaway, John B. Merrill, David Vance.
Mobile, Ala.....	Mobile Cotton Exchange.....	W. H. Gardner, Adolph Proskaner, D. E. Huger.
Do.....	Mobile Chamber of Commerce.	Hon. Peter Hamilton, W. H. Gardner, E. O. Zadek.
Nashville, Tenn.....	Merchants' Exchange.....	J. W. Hopkins, E. D. Hicks, H. W. Grantland.
New Haven, Conn.....	Chamber of Commerce.....	Henry G. Lewis, Johnson T. Platt.
New London, Conn.....	Chamber of Commerce.....	James Fitch, George T. Marshall, H. S. Bartlett, E. A. Delaney, R. M. Waterman, Leonard Smith.
New Orleans, La.....	Cotton Exchange.....	Jas. A. Benshaw, chairman; J. L. McLean, R. S. Day, J. P. Dobbins.
Do.....	Produce Exchange.....	J. T. Brodnax, H. J. Roman, C. H. Allen.
Do.....	Sugar Exchange.....	J. Barkley, B. M. King, W. B. Bloomfield, P. Lanauz, W. Henderson.
New York City.....	Cotton Exchange.....	Walter T. Miller, Jas. F. Maury, Wm. P. Campbell.
Norfolk, Va.....	Norfolk and Portsmouth Cotton Exchange.	John N. Vaughan, Adam Tredwell.
Omaha, Nebr.....	Board of Trade.....	Thomas Gibson, Andrew Rosewater, Peter Windheim, F. C. Festner.
Oswego, N. Y.....	Board of Trade.....	J. L. McWhorter, A. S. Failing, W. R. Hosmer.
Pensacola, Fla.....	Board of Trade and Exchange.	Hon. S. C. Cobb, Hon I. M. Tarble, H. Baars.
Philadelphia, Pa.....	Philadelphia Maritime Exchange.	Charles Gibbons, jr.; Edmund D. Smith, George E. Bartol.
Pittsburg, Pa.....	Coal Exchange.....	Richard Barrows, M. E. Lynn, John W. Risher.
Portland, Me.....	Board of Trade.....	C. H. Farley, M. N. Rich, William Senter.
Portland, Oreg.....	Chamber of Commerce and Board of Trade.	Rev. Dr. Geo. H. Atkinson, E. H. Page, George H. Himes.
Rochester, N. Y.....	Merchants' Exchange.....	John Siddons, H. S. Hebard, George Schofield.
San Diego, Cal.....	Society of Natural History.	Dr. G. W. Barnes, E. J. Buell, C. J. Fox.
Sandusky, Ohio.....	Board of Trade and City Council.	J. O. Moss, C. N. Ryan, R. B. Hubbard.
San Francisco, Cal.....	Chamber of Commerce.....	William L. Merry, Jacob S. Tabor, W. W. Dodge.
Savannah, Ga.....	Savannah Cotton Exchange.	C. M. Holst, A. L. Hartridge, J. J. Wilder.
Shreveport, La.....	Cotton Exchange.....	Col. R. H. Lindsay, Henry Florasheim, F. J. Alcocke.
Saint Louis, Mo.....	Merchants' Exchange.....	D. H. Bartlett, James L. Huse, John H. Carroll, Frank L. Johnston, Henry Laurey, C. S. Rogers.
Do.....	Cotton Exchange.....	I. T. Watson, sr.; C. W. Simmons, H. L. Rountree, J. H. Cogswell, C. S. Freeborn, Thomas S. Meir, W. E. Love.
Saint Paul, Minn.....	Saint Paul Chamber of Commerce.	R. O. Sweeney, Rev. David Breed, M. N. Kellogg.
Toledo, Ohio.....	Toledo Produce Exchange.....	W. T. Walker, W. H. Bellman, John Cummings.
Vicksburg, Miss.....	.....	Capt. E. C. Carroll, Thomas Mount, Dr. G. W. Howard, J. D. Tieney.
Wilmington, N. C.....	Chamber of Commerce.....	A. H. Van Bokkelen, Geo. Harris, William L. De Rosset.
Yankton, Dak.....	.....	J. C. McVay, chairman, president First National Bank; A. W. Barber, H. G. Clark.

APPENDIX 65.

REPORT OF THE FACT AND INTERNATIONAL BULLETIN DIVISION.

OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, D. C., July 1, 1885.

In this division are prepared the Monthly Weather Review, the Summary and Review of International Meteorology, and the International Bulletin.

In the Review are discussed the general weather conditions for each month and any abnormal features. The tabulated reports and charts of this publication are of the greatest importance to all interested in meteorology. With the Review for August was issued a new chart (No. IV), exhibiting the departures from the normal atmospheric pressure and temperature; this chart is now a permanent feature of the Review, and its issue has elicited favorable comment from meteorologists.

The Summary and Review of International Meteorology has been continued, and efforts are being made to bring up to date the series of international charts (No. III—storm tracks) accompanying this publication. The increased amount of data now received (principally marine observations) renders possible a more accurate tracing of the storm centers, and greatly increases the value of the charts.

The International Bulletin was issued during the year, but it has been decided to discontinue its publication after June 30, 1885; the issue of the daily international chart (No. I), however, will be continued, the map being on a much larger scale than heretofore. For the names of chiefs of meteorological services of the different countries who have rendered valuable services in the execution of this work, see Appendices, which also give a list of steamship lines co-operating, and complete information as to all sources from which data are received.

H. H. C. DUNWOODY,
First Lieutenant Fourth Artillery and Assistant.

APPENDIX 65 A.

List of military posts from which monthly meteorological reports have been received at the office of the Chief Signal Officer during the year ending June 30, 1885.

Military posts.	State or Territory.	Military posts.	State or Territory.
Abraham Lincoln.....	Dakota.	Mojave.....	Arizona.
Alcatraz Island.....	California.	Monroe.....	Virginia.
Angel Island.....	Do.	Meade.....	Dakota.
Assinaboine.....	Montana.	Mount Vernon Barracks	Alabama.
Barrancas.....	Florida.	Mason.....	California.
Benicia Barracks.....	California.	Niagara.....	New York.
Brady.....	Michigan.	Pembina.....	Dakota.
Bidwell.....	California.	Plattsburg Barracks.....	New York.
Buford.....	Dakota.	Preble.....	Maine.
Bridger.....	Wyoming.	Presidio of San Francisco	California.
Brown.....	Texas.	Randall.....	Dakota.
Columbus.....	New York.	Reno.....	Indian Territory.
Concho.....	Texas.	Robinson.....	Nebraska.
David's Island.....	New York.	Shaw.....	Montana.
Ellis.....	Montana.	Sisseton.....	Dakota.
Fred Steele.....	Wyoming.	Snelling.....	Minnesota.
Gaston.....	California.	Saint Francis Barracks..	Florida.
Hamilton.....	New York.	Sully.....	Dakota.
Jefferson Barracks.....	Missouri.	Spokane.....	Washington.
Keogh.....	Montana.	Totten.....	Dakota.
Klamath.....	Oregon.	Townsend.....	Washington.
Lyon.....	Colorado.	Union.....	New Mexico.
Lewis.....	Do.	West Point.....	New York.
Madison.....	New York.	Wingate.....	New Mexico.
McDermitt.....	Nevada.	Yates.....	Dakota.
McDowell.....	Arizona.		
McHenry.....	Maryland.		

APPENDIX 65 B.

The following is a list of post-offices of voluntary observers who have transmitted monthly reports to the office of the Chief Signal Officer during the year ending June 30, 1885.

[Their names are published in the Monthly Weather Review issued from this office.]

Post-office.	State or Territory.	Post-office.	State or Territory.
Antrim.....	New Hampshire.	Carthage.....	Missouri.
Ashwood.....	Tennessee.	Comfort.....	Texas.
Amherst (3).....	Massachusetts.	Charleston.....	Illinois.
Anna.....	Illinois.	Colorado Springs.....	Colorado.
Accotink.....	Virginia.	Clyde.....	Ohio.
Albany.....	Oregon.		
Austin.....	Tennessee.	De Soto.....	Nebraska.
Albany.....	New York.	Dyberry.....	Pennsylvania.
Archer.....	Florida.	Des Moines.....	Iowa.
Austin.....	Texas.	Dudley.....	Massachusetts.
Andersonville.....	Georgia.	Dorset.....	Vermont.
Allison.....	Kansas.	Drifton.....	Pennsylvania.
Aiken.....	South Carolina.	Dillingersville.....	Do.
Auburn.....	New York.	Dale Enterprise.....	Virginia.
Atchison.....	Kansas.	Deersfield.....	Massachusetts.
Ainsworth.....	Washington.	Dover.....	New Jersey.
Athens.....	Georgia.		
Ann Arbor.....	Michigan.	Embaras.....	Wisconsin.
Albion.....	Idaho.	Eola.....	Oregon.
Altoona.....	Pennsylvania.	Emporia.....	Kansas.
Ashville.....	North Carolina.	Emmitsburg.....	Maryland.
Ashland.....	New Hampshire.	Edgington.....	Illinois.
		Elk Falls.....	Kansas.
Beloit.....	Wisconsin.	Easton (2).....	Pennsylvania.
Blooming Grove.....	Pennsylvania.	Ellensburg.....	Washington.
Bunker Hill.....	Illinois.	East Portland.....	Oregon.
Blue Hill.....	Massachusetts.	Elk Park.....	North Carolina.
Bethel.....	Connecticut.	Fremont.....	Nebraska.
Brevard.....	North Carolina.	Fort Scott.....	Kansas.
Blakeley.....	Washington.	Factoryville.....	New York.
Belvidere.....	New Jersey.	Franklin.....	Pennsylvania.
Burlington.....	Vermont.	Fort Wayne.....	Indiana.
Bandon.....	Oregon.	Forsyth.....	Georgia.
Blacksburg.....	Virginia.	Fall River.....	Massachusetts.
Blue Lake.....	California.	Frankfort.....	Kentucky.
Birmingham.....	Alabama.	Fallsington.....	Pennsylvania.
Boyer.....	Michigan.	Fallston.....	Maryland.
Bird's Nest.....	Virginia.	Fort Madison.....	Iowa.
Bruington.....	Do.	Fort Collins.....	Colorado.
Birmingham.....	Michigan.	Franklin.....	Wisconsin.
Brattleborough.....	Vermont.	Fall Brook.....	California.
Buchanan.....	Michigan.	Fayetteville.....	Arkansas.
Braddock.....	Colorado.	Flat Rock.....	North Carolina.
Bristol.....	New Hampshire.	Fairbury.....	Nebraska.
Belmont.....	Do.		
Benaja.....	North Carolina.	Germantown.....	Pennsylvania.
		Genoa.....	Nebraska.
Cumberland.....	Maryland.	Gardiner.....	Maine.
Charlotte.....	Vermont.	Guttenberg.....	Iowa.
Cambridge.....	Massachusetts.	Grampian Hills.....	Pennsylvania.
Cornish.....	Maine.	Grand Coteau.....	Louisiana.
Catawissa.....	Pennsylvania.	Greetsville.....	Ohio.
College Hill.....	Ohio.	Greensborough.....	Alabama.
Clay Centre.....	Kansas.	Green Springs.....	Do.
Cresco.....	Iowa.	Guilford.....	Indiana.
Cooperstown.....	New York.	Gallinas Spring.....	New Mexico.
Carson City.....	Nevada.	Grand Junction.....	Colorado.
Curryville.....	Missouri.		
Cleveland.....	Ohio.	Heath.....	Massachusetts.
Cincinnati.....	Do.	Hilldale.....	Michigan.
Cedar Rapids (2).....	Iowa.	Helveta.....	West Virginia.
Collinsville.....	Illinois.	Humboldt (2).....	Iowa.
Chambersburg.....	Pennsylvania.	Haverford College.....	Pennsylvania.
Chapel Hill.....	North Carolina.	Highlands.....	North Carolina.
Caldwell.....	New Jersey.	Humphrey.....	New York.
Cleburne.....	Texas.	Hubberville.....	Pennsylvania.
Contoocook.....	New Hampshire.	Hudson.....	Michigan.
Conception.....	Missouri.	Hyoeseville.....	California.
Crete.....	Nebraska.	Hasting.....	Minnesota.
Chester.....	Minnesota.	Hiram.....	Ohio.
College City.....	California.	Hartford.....	Connecticut.
Currie.....	Minnesota.	Holm.....	Kansas.
Clinton.....	Indiana.	Harvard.....	Nebraska.
Clarksville.....	Texas.	Harrisville.....	Michigan.

The following is a list of post-offices of voluntary observers who have transmitted monthly reports to the office of the Chief Signal Officer, &c.—Continued.

Post-office.	State or Territory.	Post-office.	State or Territory.
Huntsville.....	Texas.	New Ulm.....	Texas.
Honey Grove.....	Do.	North Volney.....	New York.
Indianola.....	Iowa.	New Bedford.....	Massachusetts.
Ithaca (2).....	New York.	Nephi.....	Utah.
Independence.....	Iowa.	Newport.....	Florida.
Independence.....	Kansas.	New Athens.....	Ohio.
Ionia.....	Michigan.	Nayatt Point.....	Rhode Island
Independence.....	Missouri.	North Colebrook.....	Connecticut
		Norfolk.....	Do.
Jacksonborough.....	Ohio.	Orono.....	Maine.
Johnsontown.....	Virginia.	Oakland.....	California.
Jeffersonville.....	Indiana.	Oakaloosa.....	Iowa.
Jefferson.....	Ohio.	Ogretta.....	North Carolina.
		Ottumwa.....	Iowa.
Kalamazoo.....	Michigan.	Oswego.....	Kansas.
Klamath Agency.....	Oregon.	Oroville.....	California.
Kiantone.....	New York.		
Kelly.....	North Carolina.	Peoria.....	Illinois.
		Port Jervis.....	New York.
Lansing (2).....	Michigan.	Penn Yan.....	Do.
Logan.....	Iowa.	Phillipsburg.....	New Jersey.
Lawrence.....	Kansas.	Pierce City.....	Missouri.
Lunenburg.....	Vermont.	Paterson.....	New Jersey.
Lenoir.....	North Carolina.	Pro Tem.....	Missouri.
Laconia.....	Indiana.	Poway.....	California.
Logansport.....	Do.	Princeton.....	Do.
Lafayette.....	Pennsylvania.	Portsmouth.....	Ohio.
Leetsdale.....	Florida.	Princeton.....	Massachusetts.
Limona.....	Wisconsin.	Perry.....	Nebraska.
Lapaster.....	Kansas.	Pueblo.....	Colorado.
Leavenworth.....	Louisiana.	Puerto de Luna.....	New Mexico.
Liberty Hill.....	Do.	Providence.....	Rhode Island.
Luling.....	New York.	Prairie du Chien.....	Wisconsin.
Le Roy.....	Michigan.	Palo Alto.....	Mississippi.
Lexington.....	North Carolina.	Princeton (2).....	New Jersey.
Lincolnton.....	Massachusetts.	Point Pleasant.....	Louisiana.
Leicester.....	Indiana.	Pacolet.....	South Carolina.
La Grange.....	New Hampshire.	Post Mills.....	Vermont.
Lake Village.....	California.		
Los Angeles.....		Quakertown.....	Pennsylvania.
		Quitman.....	Georgia.
McDonogh.....	Maryland.		
Marshall.....	Michigan.	Bowe.....	Massachusetts.
Minneapolis.....	Minnesota.	Rockford.....	Illinois.
Manitowoc.....	Wisconsin.	Ripon.....	Wisconsin.
Mayport.....	Florida.	Readington.....	New Jersey.
Marengo.....	Illinois.	Red Willow.....	Nebraska.
Mendon.....	Massachusetts.	Richardton.....	Dakota.
Mount Ida.....	Arkansas.	Richmond.....	Kentucky.
Manhattan (2).....	Kansas.	Rising Sun.....	Indiana.
Muscatine.....	Iowa.	Raleigh.....	North Carolina.
Moorestown.....	New Jersey.	Round Grove.....	Iowa.
Mount Vernon.....	Iowa.	Readville.....	Massachusetts.
Morrison.....	Dakota.	Reed City.....	Michigan.
Mattoon.....	Illinois.		
Marion.....	Virginia.	Somerset.....	Massachusetts.
Monticello.....	Iowa.	South Orange.....	New Jersey.
Mountainville.....	New York.	Sandusky.....	Ohio.
Mendon.....	Michigan.	Snowville.....	Virginia.
Marquette.....	Nebraska.	Southington.....	Connecticut.
Madison.....	Wisconsin.	Savannah.....	Ohio.
Milan.....	Tennessee.	Salina.....	Kansas.
Mottville.....	Michigan.	Swanwick.....	Illinois.
Manchester.....	Iowa.	Stratford.....	Vermont.
Manistique.....	Michigan.	Stateburg.....	South Carolina.
Milledgeville.....	Georgia.	Salinas City.....	California.
Maud.....	Kansas.	Somerville.....	New Jersey.
Maynard.....	Iowa.	State College.....	Pennsylvania.
Manatee.....	Florida.	Sacramento.....	California.
Mauzy.....	Indiana.	Stockham.....	Nebraska.
Madison.....	Nebraska.	Swartz Creek.....	Michigan.
Moorestown.....	Michigan.	Sussex.....	Wisconsin.
Mahanoy Plane.....	Pennsylvania.	Spiceland.....	Indiana.
Medora.....	Dakota.	Sunman.....	Do.
		Springfield.....	Arkansas.
Northfield.....	Minnesota.	Sycamore.....	Illinois.
Neillsville.....	Wisconsin.	Sandwich.....	Do.
Newport.....	Vermont.	Statesville.....	North Carolina.
Northport.....	Michigan.	Syracuse.....	New York.
North Lewisburg.....	Ohio.	Salem.....	New Jersey.

The following is a list of post-offices of voluntary observers who have transmitted monthly reports to the office of the Chief Signal Officer, &c.—Continued.

Post-office.	State or Territory.	Post-office.	State or Territory.
Sherlock.....	Kansas.	Williamstown.....	Massachusetts.
Springfield.....	Missouri.	Wabash.....	Indiana.
San Rafael.....	California.	Westborough.....	Massachusetts.
Sterling.....	Kansas.	Wytheville (2).....	Virginia.
Summit.....	Virginia.	Washington (5).....	District of Columbia.
South Bethlehem.....	Pennsylvania.	White Plains.....	New York.
Stowe.....	Vermont.	Wellsburg.....	West Virginia.
South Evanston.....	Illinois.	Westerville.....	Ohio.
Seward.....	Nebraska.	Wellington.....	Kansas.
Traverse City.....	Michigan.	Woodstock.....	Vermont.
Thornville.....	Do.	Willsborough.....	Pennsylvania.
Topeka.....	Kansas.	Worcester.....	Massachusetts.
Tallahassee.....	Florida.	Wauseon.....	Ohio.
Taunton.....	Massachusetts.	Weir's Bridge.....	New Hampshire.
Terre Haute.....	Indiana.	Woodstock.....	Do.
Troy.....	Pennsylvania.	Wolfborough.....	Do.
Tamaqua.....	Do.	Wilkesbarre.....	Pennsylvania.
Tucson.....	Arizona.	Webster.....	Dakota.
Tecumseh.....	Nebraska.	West Bend.....	Iowa.
Tacoma.....	Washington.	Wausau.....	Wisconsin.
Tiffin.....	Ohio.	Wyandotte.....	Kansas.
Tower House.....	California.	Westmoreland.....	Do.
Variety Mills.....	Virginia.	Warrenton.....	Missouri.
Vevay.....	Indiana.	Wilton Centre.....	Illinois.
Vermillion.....	New York.	West Union.....	Iowa.
Voluntown.....	Connecticut.	Waterville.....	Maine.
Vermillion.....	Dakota.	Washington.....	Pennsylvania.
Vineland.....	New Jersey.	Wysox.....	Do.
Woodstock.....	Maryland.	Wentworth.....	Dakota.
West Chester.....	Pennsylvania.	Yates Centre.....	Kansas.
Weldon.....	North Carolina.	Yutan.....	Nebraska.
		Yellow Springs.....	Ohio.

FOREIGN COUNTRIES.

Post-office.	Country.	Post-office.	Country.
Coal Harbor.....	British Columbia.	Mazatlan.....	Mexico.
Grand Turk.....	British West Indies.	Paramaribo.....	Dutch Guiana.
Mount Forest.....	Canada.	York Factory.....	Canada.

APPENDIX 65 c.

List of State weather services from which meteorological reports have been received at the office of the Chief Signal Officer during the year ending June 30, 1885.

Alabama State weather service, under direction of Prof. P. H. Mell, jr., Auburn, Ala.
Georgia State weather service, under direction of J. T. Henderson, commissioner of agriculture, Atlanta, Ga.

Illinois State weather service, under direction of C. F. Mills, secretary of the State board of agriculture, Springfield, Ill.

Indiana State weather service, under direction of Prof. H. A. Huston, Lafayette, Ind.
Indiana volunteer weather service, under direction of Prof. W. H. Ragan, Greencastle, Ind.

Iowa State weather service, under direction of Prof. Gustavus Hinrichs, Iowa City, Iowa.

Louisiana State weather service, under direction of Mr. Robert S. Day, New Orleans, La.

Michigan State weather service, under direction of Dr. H. B. Baker, Lansing, Mich.
Minnesota State weather service, under direction of Prof. W. W. Payne, Northfield, Minn.

Mississippi State weather service, under direction of Prof. R. B. Fulton, Oxford, Miss.
Missouri State weather service, under direction of Prof. F. E. Nipher, Saint Louis, Mo.
Nebraska State weather service, under direction of Prof. G. D. Swesey, Crete, Nebr.

New England Meteorological Society, under direction of Prof. W. Upton, Providence, R. I.
 New Jersey State weather service, under direction of Mr. W. E. Cass, Newark, N. J.
 Ohio State weather service, under direction of Prof. T. C. Mendenhall, Columbus, Ohio.
 Tennessee State weather service, under direction of A. J. McWhirter, commissioner of agriculture, Nashville, Tenn.

APPENDIX 65 D.

List of foreign meteorological bureaus, vessels, and stations from which international simultaneous observations have been received.

Algeria and Tunis, by M. Thivenet, director of the Meteorological College of Science of Algeria.

Australia, by R. L. J. Ellery, director of the observatory at Melbourne, New South Wales.

Austria-Hungary, by Prof. Dr. Julius Hann, director of the Imperial and Royal Central Meteorological Institute at Vienna.

Belgium, by J. C. Houzeau, director of the Royal Observatory at Brussels.

Brazil, by Prof. E. Cruls, director of the Imperial Observatory at Rio de Janeiro.

Great Britain, by the Meteorological Council, London, Robert H. Scott, F. R. S., secretary.

Canada, by Charles Carpmel, A. M., F. R. A. S., director of the Magnetic Observatory at Toronto, and superintendent of the Meteorological Office of the Dominion of Canada.

Cape Colony, by the Meteorological Commission of Cape Colony at Cape Town.

Chili, by authority of the secretary of public instruction, through Francisco Vidal Gormaz, president of the Central Meteorological Office at Santiago.

China, by W. Dorberck, Government astronomer, director of the observatory at Hong Kong, and by Marc. Dechevrens, S. J., director of the Meteorological Observatory at Zi-Ka-Wei.

Denmark, by Adam Paulsen, director of the Royal Danish Meteorological Institute at Copenhagen.

Egypt, by Albert Ismailun, director of the Laboratoire Khédivial du Caire.

France, by Prof. E. Mascart, director of the Central Meteorological Bureau of France.

Germany, by Prof. Dr. G. Neumayer, director of the German Marine Observatory at Hamburg.

Greece, by D. K. Kokkides, director of the Royal Observatory at Athens.

India, by H. F. Blanford, meteorological reporter to the Government of India.

Italy, by his excellency the minister of agriculture, industry, and commerce, through Prof. P. Tacchini, director of the Central Meteorological Office at Rome.

Japan, by the geographical bureau, department of the interior, through I. Arai, director of the Imperial Meteorological Observatory at Tokyo.

Mauritius, by C. Meldrum, secretary of the Meteorological Society of Mauritius.

Mexico, by authority of the secretary of public works, through Senor Mariano Bárcena, director of the Central Meteorological Observatory at Mexico.

Netherlands, by Prof. Buys Ballot, director of the Royal Meteorological Institute at Utrecht.

Norway, by Prof. H. Mohn, director of the Royal Norwegian Meteorological Institute at Christiania.

Portugal, by J. C. de Brito Capello, director of the Meteorological Observatory of the Infante Dom Luiz at Lisbon.

Russia, by Prof. H. Wild, director of the Imperial Central Physical Observatory of Russia at St. Petersburg.

Spain, by the director of the Royal Observatory at Madrid.

Sweden, by Prof. R. Rubenson, director of the Royal Swedish Meteorological Institute at Stockholm, and by Prof. H. H. Hildebrandsson, director of the Meteorological Observatory at Upsala.

Switzerland, by Prof. E. Gautier, director of the observatory at Geneva.

Turkey, by A. Coumbary, effendi, director of the Central Observatory at Constantinople, and by Robert H. West, B. A., director of the Lee Observatory at Beirut.

United States of Colombia, by Ensign R. K. Wright, United States Navy, in behalf

of the General Interoceanic Canal Company, and the respective observers of all sub-series.

British Naval, by the Meteorological Council of London, through Robert H. Scott, F. R. S., secretary.

Portuguese Naval, by J. C. de Brito Capello, director of the Meteorological Observatory of the Infante Dom Luiz at Lisbon.

United States Navy, by the honorable the Secretary of the Navy, through Commodore John G. Walker, U. S. N., Chief of the Bureau of Navigation.

Series.	Stations reporting.	Series.	Stations reporting.
Algerian	9	Mexican	2
Australian	3	Netherlands	6
Austro-Hungarian	12	Norwegian	4
Belgian	4	Portuguese	9
Brazilian	1	Russian	40
British	27	Spanish	10
Canada	39	Swedish	6
Cape Colony	3	Swiss	1
Chilian	7	Turkish	4
Chinese	2	United States of Colombia	2
Danish	9	United States sub-series	6
Egyptian	1		
French	43	Total number of foreign stations reporting daily	233
German	18	United States series	125
Greek	1		
Indian	23	Total number of stations reporting daily to June 30, 1885 (land)	468
Italian	17		
Japanese	23		
Mauritius	1		

SUMMARY.

Number of vessels reporting in the—	
British navy	43
Portuguese navy	1
United States Navy	39
Marine reports furnished by the New York Herald weather service; vessels	68
Steamships, sailing vessels, &c., reporting direct to this office	419
Total naval and marine reports to June 30, 1885	565
Total land stations reports to June 30, 1885	468
Total number of international reports to June 30, 1885	1033

APPENDIX 66.

REPORT OF ASSISTANT IN CHARGE OF STUDY DIVISION.

STUDY DIVISION, *August 24, 1885.*

SIR: I have the honor to submit the accompanying as my annual report of work done in the Study Division. The appendices A to H will be shortly submitted in duplicate. Very respectfully submitted.

CLEVELAND ABBE,
Professor and Assistant.

The CHIEF SIGNAL OFFICER.

APPENDIX 66 A.

Annual report of Study Division, June 30, 1885.

PERSONAL.

During the past fiscal year the changes in this division have been as follows:

Professor Marvin was assigned to duty September 1, 1884, and was transferred to the Physical Laboratory in January, 1885; Sergeant Marbury was transferred to Marine Agency December 11, 1884; Corporal Daniels was transferred to Marine Agency December 3, 1884; Private Dilley was assigned to duty, December 3, 1884.

CONSULTING SPECIALISTS.

As occasion has required, special questions have been referred to eminent scientists who have kindly acted gratuitously as consulting specialists.

TABLES.

The tables referred to this division for preparation and revision have been the following:

(1) Tables and instructions for the application of the gravity correction, prepared for use on and after January 1.

(2) The revision of tables for the computation of dew-point and humidity: these are now being prepared conjointly with Professors Ferrel and Marvin. An independent investigation of one portion of this subject has been prosecuted by Professor Hazen in connection with the exposure of thermometers.

(3) The annual revision of the table of monthly constants for reduction of the barometer to sea level at Signal Service stations has been made and promulgated as General Orders No. 6, 1885. A corrected copy of this table, together with all changes made up to June 30, is submitted herewith. Improved methods for this reduction have also been prepared and recommended by me for adoption in place of the monthly constants now in use, as the latter often give very objectionable distortions of the isobars. Numerous smaller tables have been prepared for use in the Fact and International Bulletin Division.

INSTRUMENTAL STANDARDS.

The general question of the construction and preservation of the instrumental standards of this office was by Instructions No. 6, 1885, transferred to the Physical Laboratory Division. I have, therefore, referred to that division with appropriate recommendations, such unfinished work and new questions as refer to this subject.

STANDARD EXPOSURES AND ERRORS DUE TO EXPOSURE AND ESTABLISHMENT OF INSTRUMENTS.

(a) *Barometer*.—No changes in the method of mounting the barometer has taken place since the introduction of the barometer box. In order to ascertain the possible influence of wind, and especially the correction for the effect of suction up a chimney upon the pressure within a room in direct connection therewith, I have devised the form of mounting mentioned in my previous reports, and recommend that a trial of it be made.

The errors incurred in changing the locations of barometers at stations have been investigated, and a report submitted from which it is seen that sometimes comparisons are not at present made with sufficient accuracy to determine instrumental changes less than 0.01 or even 0.02 inch.

(b) *Thermometers*.—The question of the proper exposure of thermometers has continued a matter of careful study in this division. Extensive experiments have been carried on both in this city and at Fort Myer and in other places. A report on the work accomplished, embodying the results of all the experiments, has been prepared by Professor Hazen and published as Professional Paper No. XVIII (now in press). As a practical application of the results of these investigations an improved shelter has been adopted, by the recommendation of a special board of officers, especially on that of Professor Hazen, and has already been supplied to many Signal Service stations. Continuous attention is also devoted to the locations and environments of thermometers and shelters and many improvements have been made.

The special board just alluded to has decided to adopt some form of whirling thermometer simultaneously with the adoption of Ferrel's improved psychrometric tables.

(c) *Anemometers*.—These have always been established at Signal Service stations as high as practicable above the roof or ground. Observations have shown that the velocity of the wind increases quite rapidly up to an altitude of about 100 feet, and after that more slowly. No uniform altitude for location of anemometers has been adopted nor is practicable, but a method of reducing all records to a standard altitude is desirable.

The comparison of anemometers on station with the standard at Washington by means of substandards that are carried by inspecting officers has never yet been attempted by this service, but evidently should not longer be neglected. A first series of this kind has been made and demonstrates the practicability and importance of such work.

From measurements made as to dimensions of station anemometers, I find that our recorded velocities are in excess by about 20 per cent. of their true value as computed by Dohrandt's formula; in other words our records should be multiplied by the factor .85 to obtain the correct velocities. The application of this correction will, it seems to me, be an important improvement in our work and a proposition to the next International Congress looking to the general adoption of a similar instrumental correction is recommended by me. The exact determination of the above factor for each anemometer by the use of the whirling table should be made the duty of the Physical Laboratory as soon as it is practicable to establish the apparatus.

As requests are frequently made for data as to the force of the gusts in our heaviest hurricanes and tornadoes, to the observation of which the Robinson anemometer is not adapted, I have for several years desired to construct and experiment with several special forms of anemometers, hoping thereby to obtain the data desired by builders and engineers. Apparatus for this purpose has been designed and its construction is recommended by me.

(d) *Rain-gauge*.—The effect of variations in the exposure of rain-gauges has been studied by special observations at Mount Washington and by duplicate records made at about sixty other stations. On account of the large variation due to roof exposure in the collection of rain and snow, it may become necessary to establish standard rain-gauges in open fields outside the cities occupied by Signal Service stations. Our rainfall as at present recorded varies from what appears to be the true amount by percentages, ranging from 40 per cent. deficiency to a slight excess. The remedies for this are (1) improved exposures, or (2) the correction of present records. As to the first, efforts are being made wherever possible to improve the exposure; as to the second, a correction to annual averages may perhaps be obtained, but not one for monthly or individual record.

DROSOMETER.

In answer to several requests for apparatus for measuring dew, I have sketched out a simple form which has met with the approval of Professor Mendenhall, and with which he has promised to make comparative observations with a standard before issuing to stations.

EVAPORIMETER.

The question of evaporation from water and snow, and especially from vegetation, has continued to be entirely omitted from the schedule of Signal Service observations. This neglect of a matter in many respects so important is partly explicable by the difficult and unsatisfactory nature of the methods of observing, and partly by our indulging the hope that on account of its bearing on agriculture the matter would be more fully taken up by the agricultural colleges and State weather services. To a certain extent the difference between the wet bulb and dew point on the one hand and the wet bulb and dry bulb on the other gives us the means of determining the general character of the prevailing evaporation. Many important meteorological problems can however be answered only by knowing definitely the amount of evaporation from each portion of the earth's surface. I therefore consider it urgently desirable to inaugurate observations on this subject at a number of selected stations.

SKY COLORS.

The accurate observation of the colors of the sky promises to give important information with regard to the vapor and dust suspended therein. These observations should cover not only the blue tints recorded by the use of Arago's cyanometer, but also the red, purple, and green that are frequently observed. Probably some modification of Maxwell's color box will be found the most convenient apparatus, and several capable men should be set to work on this problem. It will be remembered that the red skies of 1883 found us wholly unprepared for this kind of observation, a misfortune that should not be allowed to happen again.

SPECTROSCOPE AND POLARISCOPE.

Each of these instruments offers in its own way information relative to the moisture in the atmosphere not obtainable from other sources. Through the kind co-operation proffered by Professor Cook, of Dartmouth College, and Professor Pickering, of Harvard University, it is hoped that valuable results may be obtained from observations with the modified forms of these instruments that have been devised.

TIME.

I attended as a delegate the International Prime Meridian and Time Conference, held in this city in October, 1884. The standard clock is in the hands of the makers for necessary alterations. The fire-proof room for the preservation of a constant temperature around the clock has been transferred to the Stations Division for the storage and preservation of records. On January 1, 1885, the clocks at all Signal Service stations were set to the time of the seventy-fifth meridian. To facilitate this change, a table showing for all stations the difference between true local time and seventy-fifth meridian time was prepared.

ATMOSPHERIC ELECTRICITY.

At a national congress of electricians held in September, 1884, in Philadelphia, I presented by your instructions a statement of Signal Service work in atmospheric electricity and received assurance of hearty co-operation. An advisory committee was appointed to report upon an international system of observations and records. The observations of ground currents at Ooglaamie, Alaska, have been reduced by Professor Trowbridge and Sergeant McRae for publication in Lieutenant Ray's report of his work at that station. Since December, 1884, the subject of atmospheric electricity has been transferred to the hands of Professor Mendenhall, in charge of the physical laboratory.

SOLAR RADIATION.

A standard pair of conjugate thermometers was ordered during the previous fiscal year, and although not yet received, it was decided to issue early in the present year the apparatus already on hand to twenty selected stations without waiting for the desired comparative readings, and with such instructions as might be agreed upon and recommended by Professor Ferrel and myself. The effect of the great variety of exposures that must inevitably occur at Signal Service stations was by me considered to be likely sensibly to invalidate the results, and I felt it necessary to ascertain experimentally

what method would be practicable for overcoming this difficulty. Unfortunately, the record of observations bearing on this matter was lost in the confusion incident to the fire in February, 1885. As soon as this work can be repeated and a uniform method of exposure can be decided on, or, still better, a method of correction for the peculiarities of any exposure, it will be practicable to issue the conjugate thermometers to selected stations. Meanwhile the importance of other forms of apparatus, especially the methods of chemical reactions, has been strongly urged by agriculturists because of their more direct application to the growth of plants.

The duration and intensity of sunshine constitutes an independent phenomenon having some points in common with the preceding and a simple form of sunshine recorder less expensive and more certain than the Campbell recorder is very desirable.

MOUNT WHITNEY RESERVATION.

Proposals have been received from responsible parties in California offering to secure the equipment of a full station on the Mount Whitney Reservation. It is very desirable that this should be accomplished soon.

THUNDERSTORM SUB-DIVISION.

The special observation and study of thunderstorms begun last year by Professor Hazen, with the kind co-operation of the Post-Office Department, has been carried on in the thunderstorm subdivision with valuable results. About 15,000 reports on postal cards from 2,500 observers have been received. Monthly summaries of thunderstorms are compiled for insertion in the Monthly Weather Review, and a report on the thunderstorms of May, 1884, has been published as Signal Service Note No. 20. A partial study of the storms of the year 1884 was completed in April, and, with your permission, was presented before the Philosophical Society of Washington as a summary of the results thus far obtained from this work. This paper is in course of preparation for publication.

TORNADO SUBDIVISION.

The methods of investigation in use during the preceding year have been employed this year with but few changes or additions.

A large part of the work of this subdivision consists in the collection of data relative to tornadoes and other violent local storms.

During the past year 461 additional tornado reporters have been secured, thus making the total number of tornado stations 1,307. These reporters are supplied with the necessary blanks, circulars, and envelopes to enable them to render reports to this office without expense to themselves for these materials.

In the prosecution of the work 4,744 communications have been sent out during the year and 2,770 letters received, together with 1,023 regular reports filled out on forms furnished for the report of tornadoes and destructive storms. Additional data has also been obtained from newspaper clippings either furnished by tornado reporters or obtained from the regular file of papers at this office; several hundred such clippings have been filed in tornado scrap-books during the year.

Some attention has been given to the collection of views and photographs pertaining to tornadoes; 519 have been obtained and placed in tornado albums. Seven hundred and twelve tornado reporters have been supplied with State maps for the purpose of charting thereon tornado tracks to be used in the more complete description of such storms.

For purposes of special study there have been prepared 105 charts showing the temperature and direction of the wind at numerous stations on the days on which tornadoes occurred, and as near the time of occurrence of the tornado as it was possible to obtain the observations. These charts are for the years 1882, 1883, and 1884.

Preliminary tornado charts, showing the relation of tornado centers to areas of barometric minima (4 charts in each set) were prepared for the tornadoes which occurred on July 4 and 5, August 2 and 28, September 9 and 28, 1884; January 11, March 11, 12, 27 and 28, April 1, 19, 21, 22, and 29, 1885; the total number of charts prepared being 64.

Daily tornado predictions were made by Lieutenant Finley in 1884 from March 10 to August 1, and were resumed in 1885 on June 1. The verification of these special predictions and the calculation of the proper percentage of verification has been carefully considered.

Professional Paper No. XVI, "Tornado studies for 1884," has been prepared by this subdivision; this contains among other things a chronological list of the 180 tornadoes which occurred during the year, with numerous charts showing the geographical distribution of tornadoes and their relation to barometric minima. Tornado circular No. 21 has also

been prepared and issued to reporters; this contains instructions regarding the making of comparative observations. Ten monthly abstracts of tornado reports have been prepared for the officer in charge of the Fact and International Bulletin Division to be used in the preparation of the Monthly Weather Review.

During the year all back reports have been examined, the data abstracted and entered in the tornado record books, and in local storm record books. In addition to these a number of papers, journals and other records on file in the Congressional Library have been examined and storm notes collected therefrom. The manuscript meteorological records at the Smithsonian Institution have been arranged by Professor Baird preparatory to an examination of them. A card index of all the tornadoes entered in the tornado record books has been compiled. A list of names and addresses of all tornado reporters is furnished herewith.

BIBLIOGRAPHY OF METEOROLOGY.

The compilation and editing of a complete index to the literature of meteorology was assigned to Mr. C. J. Sawyer on March 3, 1884, under my general supervision.

The material then on hand consisted of about 20,000 titles contributed by Prof. G. J. Symons, of London, and about the same number copied by myself from the Catalogue of scientific papers, published by the Royal Society.

The general plan of further work on this subject was approved by you as follows: "All additions consistent with an early publication to be secured; scope to be closely restricted to that of the Symons catalogue; bibliography to end with the year 1881; form to be that of a classed subject catalogue with full author index." This outlined plan has been strictly followed, except in so far as the want of an appropriation for printing has postponed the publication of the work, and will consequently permit a more extended collection of material.

On June 30, 1884, the number of accepted titles was about 26,853, after rejecting a large number of duplicates, and all of those relating to meteors, earthquakes, molecular physics, and other extraneous subjects, but retaining terrestrial magnetism. The work of the present year has been directed mainly to the correction and completion of defective titles and the collection of new ones.

For the latter purpose special attention has been paid to the serial literature previous to 1800, and subsequent to 1863. To do this it has been necessary personally to examine the libraries at Washington, Baltimore, and Philadelphia; the libraries of other cities will probably need to be examined in like manner. A summarized list of additions to the bibliography is given in Appendix C, which shows 20,338 new titles added during the year.

Besides the above new titles, there are on hand about 7,414 cards not yet examined for duplicates, the net addition from which will probably not be large.

The correspondence of the year has resulted in many very valuable contributions from scientists and librarians in this country and abroad.

To insure accuracy in the case of living writers, efforts have been made to obtain from authors personal lists of their publications; lithograph letters requesting such lists have been sent to 325 meteorological writers; including all countries except the German Empire, where Dr. Hellmann's employment of the same method rendered this unnecessary. Replies to 147 of these letters have been received, contributing manuscript lists of 7,495 titles.

In addition to those who have co-operated with us by furnishing lists of their own publications, many meteorologists and librarians have contributed special bibliographies for their respective countries, extracts from manuscript library catalogues, and other valuable bibliographical lists. A list of the more important of these contributions is given herewith.

When finished, the bibliography will fill two volumes of 900 octavo pages each. In order to have Volume I ready for the printer early in the fiscal year 1886-'87, the distinctive work of collection must soon cease and the entire force be employed on editorial work, consisting of classification by subjects, preparation of author index and periodical list, determination of details of publication, final revision of titles, and technical preparation for the printer.

The most difficult part of the work is the formation of a subject classification and the classification of titles under this, a work rendered especially difficult by the fact that many of the works and papers are not available for reference, often necessitating the determination of subjects from brief and ambiguous titles.

Dr. A. Lancaster, librarian of the Royal Observatory of Brussels, and joint author with Dr. Houzeau of "Catalogue des ouvrages d'astronomie et de météorologie. Bruxelles, 1878," and the admirable "Bibliographie générale de l'astronomie. Tome II. Bruxelles, 1882," has kindly granted his assistance in the formation of a subject classification, and has submitted a draft of one, which, with modifications, will answer excellently for the purpose.

The preparation of an author index will be carried on in connection with classification, and in such a way that, in case no appropriation for publishing be secured at the next session of Congress, the bibliography and index will be in the best possible form for use as a card catalogue.

LOCATIONS OF STATIONS.

The determination of the latitude and longitude and elevation of stations has continued in the hands of Professor Hazen, and revised values of these quantities have been furnished the Stations Division from time to time. The accompanying table (Appendix D) gives the elevation of all the barometers of the service on January 1, 1884, and all changes from that date up to June 30, 1885.

An attempt has been made to utilize the results of the precise line of levels now being prosecuted by the Coast and Geodetic Survey, and the elevations thus determined are properly designated in the accompanying table.

It is evident that the uncertainty of altitudes based on railroad levels may lead to appreciable errors in our barometric work, and it is very desirable that the accurate work of the Coast Survey should be extended to all our interior stations, if possible. To this end the correspondence had with the Coast Survey in 1881 has been revived, and it is hoped that it will be practicable to carry out the plan of work then mutually agreed upon.

BALLOON VOYAGES.

By an arrangement with Prof. S. A. King, aeronaut, of Philadelphia, four balloon voyages have been made, with the special object of studying the distribution of temperature and moisture. The results are of the highest accuracy, and show the desirability of similar regular work in this field. The service is indebted to Professor King, who has done this work without other remuneration than the repayment of actual expenses. A full report of the results attained by the observer, Private Hammon, will be submitted for publication.

BOLOMETER STUDIES.

During the past two years our collaborer, Prof. S. P. Langley, has experimented upon a large scale with the bolometer as a means of detecting the amount of moisture in the free open air. He states that his observations with this instrument give important data bearing upon the distribution of heat in both the earth and the atmosphere. It is to be hoped that by repeating his observations in some other climate and locality, such as that of Washington, a complete check upon his results may be obtained, and to this end I recommend that he be invited to bring his apparatus to this city, where the grounds at Fort Myer afford an excellent location.

EARTHQUAKE OBSERVATIONS.

In October, 1884, I attended a conference called by the Director of the Geological Survey to discuss methods and plans for observations of earthquakes.

On the part of this office I assured the conference that you would maintain observations and seismographic records at Signal Service stations whenever the committee should agree upon satisfactory apparatus.

INSTRUCTION IN METEOROLOGY.

The course of instruction for lieutenants at this office, having special regard to work in the Indications Division, began June 1, 1885, since which time daily lectures of two hours each have been given by Professor Mendenhall and myself.

Lectures on meteorological subjects have been delivered by myself in the Washington Young Men's Christian Association lecture course and by Professor Hazen and Sergeant Curtis at the Washington high school.

The preparation of an elementary text-book on meteorology, designed to be introductory to the higher treatise on meteorology by Professor Ferrel, has been undertaken by Mr. W. M. Davis, of Cambridge, Mass.; it will probably meet the wants of this service, and be proper to put into the hands of every officer and enlisted man. A professional paper on the theory of instruments used in meteorology has been in course of preparation by me the past year. Its contents will be orally given to the class now under instruction, whose course began on June 1.

PUBLICATIONS.

Besides a number of minor articles, the following published papers have been prepared by members of the Study Division:

- Abbe, Cleveland—Progress in Meteorology in 1884, 176 pp. 8vo, 1885.
 Testimony before the Joint Committee of Congress.
 "The earthquake of August 10." New York Herald, August 12, 1884.
 Appalachian earthquakes. New York Herald, August 15, 1884.
- Fassig, O. L.—Bibliography of Meteorology for 1884.
- Finley, Jno. (Lieut.)—Signal Service Professional Paper, No. 14.
 Signal Service Professional Paper, No. 16.
 Signal Service Tornado Circular, No. 21.
- Hazen, H. A.—"Tornado Generation." Amer. Meteor. Journal, September, 1884.
 Tornadoes. Amer. Journal of Science, vol. xxviii, September, 1884.
 Thunder-storms and their relation to "Low." Proc. A. A. A. S., vol. xxxiii.
 Philadelphia meeting, September, 1884.
 Determination of air temperature and humidity. Amer. Meteor. Journal, vol. i, Nos. 9 and 10, January, February, 1885; translation in the Zeitschrift für Meteorologie, vol. xx, March, 1885.
 Thunder-storms of May, 1884. Signal Service Notes, No. 20.
- Curtis, G. E.—Reviews of Quarterly Journal of Meteorology and Symons' Meteorological Magazine in American Journal of Meteorology.

TRANSLATIONS.

The following articles have been translated in order to make them available for general use in the office:

- "Ueber die Bestimmung der Temperatur und Feuchtigkeit der Luft." H. Wild. Zeitschrift für Meteorologie, October, 1884.
- "Sui grandi movimenti della atmosfera e sulla previsioni del tempo. Prof. D. Ragona, Modena, 1881." Graciously translated by Rev. J. Hagen.
- "Evaporation": de Saussure, in his Voyage dans les Alpes. Tome vii; chap. viii. [Climates of the globe]—Woeikof; first three chapters.
- [The Glacial Epoch]—Woeikof.
- [Glaciers and climate]—Woeikof.
- "Le Siroco en Amérique et en Asie." F. F. Hébert. Annuaire de la Société météorologique de France, pp. 85-89, vol. xxix, 1881.

APPENDIX 66 B.

SIGNAL OFFICE, WAR DEPARTMENT,
 Washington, January 31, 1885.

GENERAL ORDERS }
 No. 6.

The following table of monthly constants for the reduction of barometric observations to sea-level and standard gravity is published for the information of all concerned, and will go into daily use on March 1, 1885, replacing General Orders No. 5, from this office, series of 1884. On and after the above-mentioned date the columns of Form 113a headed "reduced to sea-level" will be amended to read "reduced to sea-level and standard gravity." The monthly mean pressures reduced to sea-level and standard gravity by this table for the months of January and February, 1885, will be inserted in red ink at the bottom of page 2 of Form 113a.

By order of the Chief Signal Officer.

B. M. PURSELL,
 Second Lieutenant, Signal Corps, U. S. Army.

Monthly constants (in inches) for the combined reduction of barometric observations made at Signal Service stations to sea-level and standard gravity.

Station.	Gravity correction.	Combined reduction constant (gravity and elevation) for each month.											
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Albany, N. Y.	-0.006	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09
Alexander, Fort, Alaska	+0.036	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Alpena, Mich.	+0.000	0.71	0.71	0.70	0.69	0.68	0.65	0.64	0.64	0.65	0.67	0.69	0.71
Apache, Fort, Ariz.	-0.025	5.09	5.07	5.00	4.90	4.80	4.73	4.72	4.70	4.77	4.88	5.08	5.06
Assinaboine, Fort, Mont.	+0.009	3.08	3.06	3.03	2.92	2.86	2.81	2.75	2.77	2.87	2.94	3.00	3.03
Atlanta, Ga.	-0.029	1.20	1.19	1.18	1.16	1.14	1.13	1.13	1.13	1.14	1.16	1.19	1.20
Atlantic City, N. J.	-0.015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Augusta, Ga.	-0.031	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16
Baltimore, Md.	-0.015	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04
Barnegat City, N. J.	-0.014	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Behring's Island, Behring Sea	+0.027	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Bennett, Fort, Dak.	-0.001	1.74	1.73	1.70	1.64	1.56	1.54	1.54	1.54	1.59	1.62	1.69	1.76
Benton, Fort, Mont.	+0.006	2.98	3.00	2.98	2.86	2.79	2.77	2.71	2.79	2.84	2.91	2.96	3.10
Bismarck, Dak.	+0.005	2.00	1.98	1.92	1.88	1.79	1.76	1.73	1.76	1.80	1.88	1.93	2.02
Block Island, R. I.	-0.010	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Boise City, Idaho	-0.004	2.93	2.96	2.92	2.84	2.84	2.78	2.72	2.75	2.77	2.86	2.94	2.99
Boston, Mass.	-0.007	0.14	0.14	0.13	0.13	0.13	0.13	0.12	0.12	0.13	0.13	0.13	0.14
Brownsville, Tex.	-0.048	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Buffalo, N. Y.	-0.005	0.78	0.79	0.78	0.76	0.73	0.72	0.71	0.71	0.71	0.74	0.77	0.79
Burnford, Fort, Dak.	+0.008	2.24	2.22	2.17	2.11	2.01	2.00	1.97	1.99	2.03	2.11	2.17	2.29
Cairo, Ill.	-0.021	0.38	0.38	0.37	0.36	0.35	0.35	0.35	0.35	0.35	0.36	0.37	0.39
Canby, Fort, Wash.	+0.004	0.21	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Cape Henry, Va.	-0.021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cape May, N. J.	-0.016	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cape Mendocino, Cal.	-0.012	0.68	0.68	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.68	0.69	0.70
Cedar Keys, Fla.	-0.041	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Charleston, S. C.	-0.032	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Charlotte, N. C.	-0.025	0.86	0.86	0.85	0.83	0.81	0.80	0.80	0.80	0.81	0.83	0.85	0.86
Chattanooga, Tenn.	-0.026	0.83	0.83	0.82	0.81	0.79	0.78	0.77	0.78	0.79	0.80	0.82	0.84
Cheyenne, Wyo.	-0.009	6.26	6.26	6.19	6.01	5.88	5.75	5.70	5.71	5.87	6.08	6.32	6.40
Chicago, Ill.	-0.008	0.74	0.74	0.73	0.72	0.69	0.69	0.68	0.68	0.69	0.71	0.73	0.73
Chincocheague, Va.	-0.019	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Cincinnati, Ohio.	-0.016	0.67	0.67	0.66	0.64	0.62	0.62	0.61	0.61	0.62	0.63	0.66	0.67
Cleveland, Ohio.	-0.010	0.77	0.78	0.77	0.75	0.72	0.72	0.71	0.71	0.71	0.73	0.76	0.78
Columbus, Ohio.	-0.013	0.90	0.90	0.89	0.87	0.84	0.83	0.82	0.82	0.83	0.86	0.89	0.91
Concho, Fort, Tex.	-0.033	1.99	1.99	1.94	1.91	1.87	1.84	1.85	1.83	1.87	1.92	1.98	1.99
Custer, Fort, Mont.	+0.002	3.38	3.36	3.33	3.18	3.10	3.06	3.02	3.06	3.12	3.24	3.32	3.40
Davenport, Iowa.	-0.010	0.70	0.69	0.68	0.66	0.64	0.63	0.62	0.62	0.64	0.65	0.68	0.70
Davis, Fort, Tex.	-0.031	1.94	1.92	1.84	1.75	1.68	1.57	1.60	1.61	1.66	1.81	1.96	1.96
Dayton, Wash.	+0.004	1.81	1.82	1.82	1.76	1.76	1.75	1.72	1.73	1.75	1.79	1.79	1.84
Deadwood, Dak.	-0.002	4.95	4.92	4.84	4.69	4.52	4.44	4.43	4.44	4.56	4.68	4.84	4.90
Delaware Breakwater, Del.	-0.017	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
Denver, Colo.	-0.012	5.51	5.51	5.43	5.20	5.15	5.03	5.00	5.01	5.04	5.25	5.49	5.51
Des Moines, Iowa.	-0.009	0.96	0.95	0.94	0.91	0.88	0.87	0.86	0.86	0.88	0.90	0.92	0.94
Detroit, Mich.	-0.007	0.73	0.75	0.74	0.72	0.69	0.69	0.68	0.68	0.69	0.71	0.74	0.76
Dodge City, Kans.	-0.018	2.71	2.70	2.69	2.60	2.51	2.47	2.46	2.44	2.51	2.59	2.70	2.76
Dubuque, Iowa.	-0.006	0.75	0.74	0.73	0.71	0.69	0.67	0.66	0.67	0.69	0.70	0.72	0.73
Duluth, Minn.	+0.005	0.80	0.80	0.78	0.76	0.74	0.72	0.71	0.71	0.71	0.73	0.76	0.80
Eastport, Me.	0.000	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Elliott, Fort, Tex.	-0.024	2.91	2.84	2.81	2.76	2.68	2.65	2.62	2.62	2.67	2.77	2.91	2.94
El Paso, Tex.	-0.030	3.85	3.85	3.77	3.71	3.61	3.56	3.57	3.57	3.62	3.71	3.82	3.85
erie, Pa.	-0.009	0.76	0.76	0.76	0.74	0.71	0.71	0.70	0.70	0.71	0.73	0.75	0.77
Escanaba, Mich.	+0.002	0.72	0.72	0.71	0.69	0.66	0.65	0.64	0.64	0.66	0.68	0.70	0.72
Fort Smith, Ark.	-0.026	0.50	0.50	0.49	0.47	0.46	0.46	0.45	0.45	0.46	0.47	0.49	0.50
Galveston, Tex.	-0.040	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grand Haven, Mich.	-0.005	0.70	0.70	0.70	0.68	0.66	0.65	0.64	0.64	0.65	0.67	0.69	0.70
Grant, Fort, Ariz.	-0.028	4.87	4.83	4.80	4.70	4.58	4.51	4.54	4.54	4.57	4.67	4.81	4.86
Greencastle, Ind.	-0.014	0.99	0.98	0.97	0.94	0.92	0.91	0.90	0.90	0.92	0.94	0.96	0.99
Hatlers, N. C.	-0.026	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Helena, Mont.	+0.003	4.88	4.35	4.32	4.21	4.12	4.07	4.01	4.04	4.12	4.25	4.33	4.33
Huron, Dak.	-0.002	1.54	1.52	1.48	1.45	1.35	1.34	1.32	1.34	1.38	1.43	1.48	1.54
Indianapolis, Ind.	-0.014	0.84	0.84	0.83	0.81	0.78	0.78	0.77	0.77	0.78	0.80	0.82	0.83
Indianola, Tex.	-0.042	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Jacksonville, Fla.	-0.038	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Keokuk, Iowa.	-0.012	0.69	0.69	0.68	0.66	0.64	0.63	0.62	0.62	0.64	0.65	0.68	0.70
Key West, Fla.	-0.051	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Kitty Hawk, N. C.	-0.021	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Knoxville, Tenn.	-0.023	1.05	1.05	1.04	1.02	0.99	0.99	0.98	0.98	0.99	1.01	1.04	1.16
La Crosse, Wis.	-0.003	0.82	0.81	0.80	0.78	0.76	0.74	0.73	0.74	0.75	0.77	0.80	0.82
Leavenworth, Kans.	-0.015	0.94	0.94	0.92	0.89	0.86	0.85	0.84	0.85	0.86	0.89	0.92	0.95
Lewiston, Idaho.	+0.004	0.83	0.83	0.82	0.80	0.79	0.78	0.77	0.77	0.78	0.80	0.81	0.84
Little Rock, Ark.	-0.024	0.29	0.29	0.29	0.24	0.27	0.27	0.27	0.27	0.27	0.28	0.29	0.29
Los Angeles, Cal.	-0.029	0.36	0.36	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.36	0.36
Louisville, Ky.	-0.018	0.59	0.59	0.58	0.58	0.56	0.56	0.55	0.55	0.56	0.57	0.58	0.59
Lynchburg, Va.	-0.020	0.70	0.70	0.70	0.68	0.66	0.65	0.65	0.65	0.66	0.67	0.70	0.71

Monthly constants (in inches) for the combined reduction of barometric observations made at Signal Service stations to sea-level and standard gravity—Continued.

Station.	Gravity cor- rection.	Combined reduction constant (gravity and elevation) for each month.											
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Mackinaw City, Mich.	+0.002	0.71	0.70	0.70	0.68	0.66	0.65	0.64	0.64	0.65	0.67	0.69	0.70
Macou, Fort, N. C.	-0.028	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Maginnis, Fort, Mont.	+0.005	4.77	4.75	4.60	4.50	4.41	4.33	4.31	4.31	4.40	4.54	4.60	4.63
Marquette, Mich.	+0.004	0.79	0.79	0.78	0.76	0.73	0.72	0.71	0.72	0.73	0.74	0.77	0.79
Memphis, Tenn.	-0.027	0.33	0.33	0.32	0.31	0.31	0.30	0.30	0.30	0.31	0.31	0.33	0.33
Milwaukee, Wis.	-0.005	0.80	0.79	0.78	0.77	0.74	0.73	0.72	0.72	0.73	0.75	0.78	0.80
Mobile, Ala.	-0.037	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Montgomery, Ala.	-0.033	0.21	0.21	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.20	0.20	0.20
Moorhead, Minn.	+0.005	1.11	1.10	1.08	1.04	0.98	0.97	0.96	0.97	1.00	1.02	1.07	1.10
Mount Washington, N. H.	-0.002	6.63	6.62	6.52	6.41	6.18	6.12	6.07	6.08	6.15	6.34	6.56	6.60
Myer, Fort, Va.	-0.016	0.29	0.29	0.28	0.28	0.27	0.26	0.26	0.26	0.26	0.27	0.28	0.28
Nashville, Tenn.	-0.023	0.58	0.58	0.58	0.56	0.55	0.54	0.54	0.54	0.55	0.56	0.58	0.58
New Haven, Conn.	-0.016	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.11	0.11	0.11
New London, Conn.	-0.010	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
New Orleans, La.	-0.039	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
New York City	-0.012	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.17	0.17	0.17
Norfolk, Va.	-0.021	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
North Platte, Nebr.	-0.010	3.10	3.08	3.04	2.94	2.85	2.78	2.78	2.78	2.86	2.94	3.06	3.10
Olympia, Wash.	+0.005	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
Omaha, Nebr.	-0.010	1.24	1.23	1.22	1.18	1.14	1.13	1.12	1.12	1.14	1.16	1.22	1.24
Oswego, N. Y.	-0.004	0.38	0.38	0.38	0.37	0.36	0.35	0.35	0.35	0.35	0.36	0.37	0.37
Palestine, Tex.	-0.033	0.53	0.54	0.54	0.53	0.52	0.51	0.51	0.51	0.52	0.53	0.54	0.54
Pennacola, Fla.	-0.038	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Philadelphia, Pa.	-0.013	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12
Pike's Peak, Colo.	-0.010	12.69	12.71	12.58	12.27	12.05	11.81	11.77	11.78	11.97	12.27	12.65	12.65
Pittsburg, Pa.	-0.012	0.85	0.85	0.84	0.82	0.80	0.79	0.79	0.79	0.79	0.81	0.84	0.85
Poplar River, Mont.	+0.008	2.36	2.36	2.31	2.21	2.13	2.11	2.07	2.09	2.16	2.23	2.30	2.37
Port Huron, Mich.	-0.005	0.72	0.72	0.71	0.70	0.67	0.67	0.66	0.66	0.67	0.68	0.71	0.72
Portland, Me.	-0.004	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05
Portland, Oreg.	+0.002	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.08	0.08	0.08	0.08
Prescott, Ariz.	-0.023	5.41	5.39	5.37	5.25	5.12	5.04	5.01	5.00	5.12	5.18	5.37	5.40
Red Bluff, Cal.	-0.013	0.35	0.35	0.34	0.34	0.33	0.33	0.33	0.33	0.33	0.34	0.35	0.35
Rio Grande City, Tex.	-0.047	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16
Rochester, N. Y.	-0.005	0.70	0.70	0.70	0.68	0.65	0.65	0.64	0.64	0.65	0.67	0.69	0.71
Roseburg, Oreg.	-0.006	0.55	0.55	0.55	0.54	0.54	0.53	0.53	0.53	0.53	0.54	0.55	0.55
Sacramento, Cal.	-0.017	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Saint Louis, Mo.	-0.017	0.63	0.62	0.62	0.60	0.58	0.58	0.57	0.57	0.58	0.60	0.62	0.63
Saint Michael's, Fort Alaska.	+0.047	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Saint Paul, Minn.	-0.000	0.94	0.93	0.91	0.88	0.84	0.84	0.83	0.83	0.85	0.87	0.91	0.94
Saint Vincent, Minn.	+0.011	0.99	0.98	0.96	0.92	0.87	0.86	0.85	0.86	0.88	0.91	0.95	1.00
Salt Lake City, Utah.	-0.009	4.56	4.55	4.51	4.36	4.31	4.21	4.17	4.18	4.24	4.39	4.56	4.53
San Diego, Cal.	-0.033	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Sandusky, Ohio.	-0.010	0.71	0.71	0.71	0.69	0.66	0.66	0.65	0.65	0.66	0.68	0.71	0.72
Sandy Hook, N. J.	-0.012	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Sanford, Fla.	-0.041	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
San Francisco, Cal.	-0.019	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Santa Fé, N. Mex.	-0.019	7.00	7.00	6.90	6.75	6.62	6.50	6.42	6.41	6.56	6.70	6.85	6.91
Savannah, Ga.	-0.034	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.06	0.06	0.06	0.06
Shaw, Fort, Mont.	+0.005	3.87	3.86	3.81	3.68	3.61	3.58	3.52	3.54	3.62	3.71	3.83	3.84
Shreveport, La.	-0.033	0.22	0.22	0.21	0.21	0.20	0.20	0.20	0.20	0.20	0.21	0.21	0.22
Sill, Fort, Ind. T.	-0.025	1.30	1.28	1.26	1.21	1.19	1.17	1.17	1.17	1.19	1.23	1.28	1.30
Sitka, Alaska.	+0.032	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Smithville, N. C.	-0.020	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Spokane Falls, Wash.	-0.007	2.15	2.14	2.14	2.07	2.06	2.05	1.99	2.01	2.05	2.09	2.09	2.14
Springfield, Ill.	-0.014	0.70	0.69	0.68	0.66	0.65	0.64	0.63	0.64	0.65	0.66	0.68	0.70
Stockton, Fort, Tex.	-0.032	3.11	3.10	3.05	3.00	2.98	2.89	2.91	2.91	2.93	3.00	3.09	3.11
Tatoosh Island, Wash.	+0.009	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.11
Thomas, Fort, Ariz.	-0.029	2.80	2.80	2.75	2.70	2.64	2.60	2.56	2.59	2.61	2.68	2.81	2.79
Toledo, Ohio.	-0.009	0.73	0.73	0.72	0.70	0.68	0.67	0.67	0.67	0.67	0.69	0.72	0.73
Totten, Fort, Dak.	+0.008	1.78	1.76	1.73	1.67	1.60	1.57	1.55	1.56	1.60	1.65	1.72	1.81
Unalaksha, Alaska.	+0.024	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Vicksburg, Miss.	-0.033	0.23	0.23	0.23	0.22	0.22	0.22	0.22	0.22	0.22	0.23	0.28	0.28
Washington City.	-0.016	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	0.10	0.10	0.10	0.10
West Las Animas, Colo.	-0.016	4.11	4.10	4.05	3.93	3.83	3.75	3.73	3.72	3.80	3.91	4.09	4.18
Wilmington, N. C.	-0.029	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Winnemucca, Nev.	-0.009	4.54	4.53	4.50	4.40	4.33	4.25	4.18	4.21	4.29	4.42	4.52	4.56
Yankton, Dak.	-0.005	1.42	1.42	1.38	1.34	1.27	1.27	1.26	1.26	1.29	1.33	1.38	1.43
Yuma, Ariz.	-0.033	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.12	0.12	0.12	0.12

Changes authorized since the beginning of the year 1885.

Station.	Gravity correction.	Combined reduction constant (gravity and elevation) for each month.											
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Roseburg, Oreg. ¹	-0.005	0.57	0.57	0.57	0.56	0.56	0.55	0.55	0.55	0.55	0.56	0.57	0.57
Cincinnati, Ohio ²	-0.016	0.69	0.69	0.68	0.66	0.64	0.64	0.63	0.63	0.64	0.65	0.65	0.65
Montrose, Colo. ³	-0.017	6.00	6.00	5.98	5.75	5.63	5.50	5.46	5.47	5.60	5.76	5.96	6.12
Lamar, Mo. ⁴	-0.020	1.18	1.18	1.12	1.06	1.05	1.04	1.03	1.03	1.05	1.08	1.11	1.13
Vicksburg, Miss. ⁵	-0.033	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.24	0.24
Do. ⁶	-0.033	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.20	0.20
San Antonio, Tex. ⁷	-0.040	0.80	0.80	0.79	0.77	0.76	0.75	0.75	0.75	0.76	0.77	0.77	0.77
Port Angeles, Wash. ⁸	+0.008	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Portland, Me. ⁹	-0.004	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11
Saint Paul, Minn. ¹⁰	0.000	0.97	0.96	0.94	0.91	0.87	0.87	0.86	0.86	0.88	0.90	0.94	0.97
San Luis Obispo, Cal. ¹¹	-0.028	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
Concordia, Kans. ¹²	-0.015	1.54	1.53	1.51	1.47	1.42	1.40	1.39	1.39	1.42	1.46	1.51	1.54

¹To date from January 1, 1885.

²After removal March 1, 1885.

³New station.

⁴After removal April 21, 1885.

⁵After removal June 1, 1885.

⁶Station reopened.

⁷After removal July 1, 1885.

APPENDIX 66 C.

Latitude, longitude, and elevation of Signal Service barometers.

[Prepared by Junior Professor H. A. Hazen.]

Station.	Latitude.	Longitude.	Elevation January 1, 1874.	Remarks.
	° /	° /	Feet.	
Albany, N. Y.	42 39	78 45	75	Moved Oct. 1, 1884. H=53.
Alexander, Fort, Alaska.	53 54	153 14		
Alpena, Mich.	45 5	83 30	609	
Apache, Fort, Ariz.	33 48	109 57	5,060 B	
Assinaboine, Fort, Mont.	48 32	109 42	2,710 B	Moved March 12, 1884. H=2,739 B
Atlanta, Ga.	33 45	84 23	1,129	
Atlantic City, N. J.	39 22	74 25	13	
Augusta, Ga.	33 28	81 54	183	
Baltimore, Md.	39 18	76 37	45	
Barnegat, N. J.	39 46	74 6	22	
Behring Island, Behring Sea.	55 12	194 5	20	
Bennett, Fort, Dak.	44 43	100 39	1,510 B	
Benton, Fort, Mont.	47 50	110 40	2,694 B	Moved April 1, 1884. H=2,681 E
Bidwell, Fort, Cal.	41 53	120 11		Established January 1, 1885.
Bismarck, Dak.	46 47	100 38	1,694	
Block Island, R. I.	41 10	71 36	27	
Boise City, Idaho.	43 37	116 8	2,750 B	
Boston, Mass.	42 21	71 4	142	Moved Oct. 1, 1884. H=125.
Bridger, Wyo.	41 28	110 30	6,643 B	
Brownsville, Tex.	25 53	97 26	59	Moved January 31, 1884. H=57.
Buffalo, N. Y.	42 53	78 53	690	
Buford, Fort, Dak.	48 0	103 56	1,930 B	
Cairo, Ill.	37 0	89 10	359	See note at end.
Canby, Fort, Wash.	46 16	124 4	179	
Cape Henry, Va.	36 56	76 0	16	
Cape May, N. J.	38 56	74 58	27	
Cape Mendocino, Cal.	40 26	124 24	637	
Cedar Keys, Fla.	29 8	83 2	22	
Charleston, S. C.	32 47	79 56	52	
Charlotte, N. C.	35 13	80 51	806	
Chattanooga, Tenn.	35 4	85 15	783	
Cheyenne, Wyo.	41 8	104 48	6,106	
Chicago, Ill.	41 52	87 38	661	
Chincoteague, Va.	37 55	75 23	18	Moved June 1, 1884. H=18.
Cincinnati, Ohio.	39 6	84 30	612	Moved March 1, 1885. H=50.
Cleveland, Ohio.	41 30	81 42	690	
Colorado City, Tex.	32 20	100 48		Established April, 1885.
Columbus, Ohio.	39 58	83 0	812	

Latitude, longitude, and elevation of Signal Service barometers—Continued.

Station.	Latitude.	Longitude.	Elevation January 1, 1884.	Remarks.
	° /	° /	Feet.	
Concho, Fort, Tex.....	31 25	100 24	1,900 B	
Concordia, Kans.....	39 35	97 41	.....	Established May 1, 1885. H=1834.
Custer, Fort, Mont.....	45 42	107 34	3,040 B	
Davenport, Iowa.....	41 30	90 38	615	
Davis, Fort, Tex.....	30 38	103 56	4,940	Moved March 3, 1884. H=4928 B.
Dayton, Wash.....	46 19	117 56	1,683 B	
Deadwood, Dak.....	44 23	103 43	4,600 B	
Delaware Breakwater, Del.....	38 48	75 10	20	
Denver, Colo.....	39 45	105 0	5,294	
Des Moines, Iowa.....	41 35	93 37	842	
Detroit, Mich.....	42 20	83 3	662	
Dodge City, Kans.....	37 45	100 0	2,517	
Dubuque, Iowa.....	42 30	90 44	665	
Duluth, Minn.....	46 48	92 6	687	Moved December 1, 1884. H=672.
Eastport, Me.....	44 54	66 59	61	
Elliott, Fort, Tex.....	35 30	100 21	2,650 B	
El Paso, Tex.....	31 47	106 30	3,764 B	
Erie, Pa.....	42 7	80 5	681	
Escanaba, Mich.....	45 48	87 5	612	Moved March 1, 1884. H=613.
Fort Smith, Ark.....	35 22	94 24	451	Moved February 1, 1885. H=470.
Frisco, Utah.....	38 25	113 16	.....	Established January, 1885.
Galveston, Tex.....	29 18	94 47	40	
Grand Haven, Mich.....	43 5	86 18	620	
Grant, Fort, Ariz.....	32 39	109 57	4,860 B	Moved February 21, 1884. H=4856.
Greencastle, Ind.....	39 39	86 51	897	
Hatteras, N. C.....	35 15	75 40	12	
Helena, Mont.....	46 34	112 4	4,069	
Huron, Dak.....	44 21	98 9	1,305	
Indianapolis, Ind.....	39 46	86 10	766	
Indianola, Tex.....	28 32	96 31	26	
Jacksonville, Fla.....	30 20	81 39	43	
Keeler, Cal.....	36 35	117 50	.....	Established February 1, 1885. Moved July 1, 1885. H=3622.
Keokuk, Iowa.....	40 22	91 26	618	
Key West, Fla.....	24 34	81 49	20	
Kitty Hawk, N. C.....	36 0	75 42	22	Moved November 1, 1884. H=9.
Knoxville, Tenn.....	35 56	83 58	960	
La Crosse, Wis.....	43 49	91 15	725	
Lamar, Mo.....	37 32	94 15	.....	Established February 26, 1885. H=1028.
Leavenworth, Kans.....	39 19	94 57	842	
Lewiston, Idaho.....	46 8	117 5	780 B	Moved January 1, 1885. H=785 B.
Little Rock, Ark.....	34 45	92 6	298	Raised April 1, 1884. H=290.
Los Angeles, Cal.....	34 3	118 15	357	
Louisville, Ky.....	38 15	85 45	551	
Lynchburg, Va.....	37 25	79 0	652	
Mackinaw City, Mich.....	45 47	84 39	605	
Macon, Fort, N. C.....	34 42	76 40	11	
Maginnis, Fort, Mont.....	47 12	109 10	4,340 B	
Marquette, Mich.....	46 34	87 24	673	
Memphis, Tenn.....	35 9	90 3	320	
Milwaukee, Wis.....	43 2	87 54	697	
Mobile, Ala.....	30 41	88 2	41	Moved July 1, 1884. H=35.
Montgomery, Ala.....	32 23	86 18	219	
Montrose, Colo.....	38 30	107 56	.....	Established December, 1884. H=5825.
Moorhead, Minn.....	46 52	96 44	926	
Mount Washington, N. H.....	44 16	71 18	6249	
Nashville, Tenn.....	36 10	86 47	549	
New Haven, Conn.....	41 18	72 56	107	
New London, Conn.....	41 21	72 5	47	
New Orleans, La.....	29 58	90 4	52	
New York, N. Y.....	40 43	74 0	164	
Norfolk, Va.....	36 51	76 17	30	
North Platte, Nebr.....	41 8	100 45	2,841	
Olympia, Wash.....	47 3	122 53	36	
Omaha, Nebr.....	41 16	95 56	1,113	
Oswego, N. Y.....	43 29	76 35	304	Moved August 1, 1884. H=335.
Palestine, Tex.....	31 45	95 40	533	
Pensacola, Fla.....	30 25	87 13	30	
Philadelphia, Pa.....	39 57	75 9	92	Moved April 1, 1884. H=117.
Pike's Peak, Colo.....	38 50	105 2	14,134	
Pittsburg, Pa.....	40 32	80 2	771	
Poplar River, Mont.....	48 8	105 10	2,030 B	
Port Angeles, Wash.....	48 7	123 6	.....	Established February 1, 1885. H=14.
Port Huron, Mich.....	43 0	82 26	633	
Portland, Me.....	43 39	70 15	45	Moved July 1, 1885. H=99.

Latitude, longitude, and elevation of Signal Service barometers—Continued.

Station.	Latitude.	Longitude.	Elevation January 1, 1884.	Remarks.
	° /	° /	<i>Feet.</i>	
Portland, Oreg.....	45 32	122 43	67	
Prescott, Ariz.....	34 33	112 28	5,340 B	Moved March 19, 1884. H=5,339 B.
Provincetown, Mass.....	42 3	70 11	26	Discontinued March 26, 1884.
Red Bluff, Cal.....	40 10	122 15	337	
Rio Grande City, Tex.....	26 23	98 48	230 B	
Rochester, N. Y.....	43 8	77 42	621	
Roseburg, Oreg.....	43 13	123 20	511	Moved August 22, 1884. H=522.
Sacramento, Cal.....	38 35	121 30	65	Moved February 1, 1884. H=64.
Saint Louis, Mo.....	38 38	90 12	571	
Saint Michael's, Fort, Alaska.....	63 28	161 48	30	
Saint Paul, Minn.....	44 58	93 3	801	
Saint Vincent, Minn.....	48 56	97 14	804	
Salt Lake City, Utah.....	40 46	111 54	4,848	
San Antonio, Tex.....	29 27	98 28	.....	Re-established March 7, 1885. H=781.
San Diego, Cal.....	32 43	117 10	67	
Sandusky, Ohio.....	41 26	82 40	688	
Sandy Hook, N. J.....	40 28	74 00	28	
Sanford, Fla.....	28 48	81 23	50 B	Moved August 1, 1884. H=25 B.
San Francisco, Cal.....	37 48	122 26	60	
San Luis Obispo, Cal.....	35 18	120 39	.....	Established June 1, 1885. H=270.
Santa Fé, N. Mex.....	35 41	105 57	.....	Re-estab. Dec. 1, 1884. H=7026.
Savannah, Ga.....	32 5	81 5	87	
Shaw, Fort, Mont.....	47 31	111 48	3,550 B	
Shreveport, La.....	32 30	93 40	227	
Sill, Fort, Ind. T.....	34 40	98 23	1,300 B	
Sitka, Alaska.....	57 3	135 19	63	
Smithville, N. C.....	38 55	78 1	34	
Spokane Falls, Wash.....	47 40	117 25	1,906	Moved December 1, 1884. H=1909.
Springfield, Ill.....	39 48	89 39	644	
Stanton, Fort, N. Mex.....	33 30	105 26	.....	Established January, 1885.
Stockton, Fort, Tex.....	30 53	102 53	3,010 B	
Tatoosh Island, Wash.....	48 28	124 44	86	
Thomas Camp, Ariz.....	33 4	110 2	2,710 B	
Toledo, Ohio.....	41 40	83 34	651	
Totten, Fort, Dak.....	47 57	98 57	.....	Established May, 1884, H=1,800.
Unalaska, Alaska.....	53 53	166 32	13	
Valentine, Nebr.....	42 50	100 32	.....	Established April 21, 1885.
Vicksburg, Miss.....	32 22	90 53	244	New office, April 21, 1885. H=252. Moved June 1, 1885. H=209.
Washington City.....	38 54	77 3	106	
West Las Animas, Colo.....	38 4	103 12	3,899	
Wilmington, N. C.....	34 14	77 57	52	
Winnemucca, Nev.....	40 58	117 43	.....	Re-established December 1, 1884. H=4358.
Yankton, Dak.....	42 54	97 28	1,228	
Yuma, Ariz.....	32 45	114 36	141	

NOTE.—It will be noted that the elevation of the following stations differs from that in the last report by the amount set against each. Cairo, 18 feet; Cincinnati, 8; Indianapolis, 13; Louisville, 21; and St. Louis, 12. These changes are not due to a removal of office, but to a redetermination of the altitude by carefully connecting with the line of precise levels being run by the United States Coast and Geodetic Survey across the Continent from Sandy Hook to the Pacific.

The case of Cincinnati is especially instructive. The former elevation depended on a large number of canal and railroad levels, all of which appeared to check within a foot and yet the final result was in error by 8 feet. The difference of 29 feet between Louisville and Cincinnati has been noticed even in the reductions of barometer readings for the isobars on the daily maps.

When this line of levels has been completed, it will afford a most important base from which we may obtain elevations on either side and at many points where great uncertainties exist at present.

APPENDIX 66 D.

List of tornado reporters, June 30, 1885.

Name.	Post-office.	County.	State or Territory.
W. E. DeLap.....	Boscobel.....	Grant.....	Wisconsin.
Snel Foster.....	Muscatine.....	Muscatine.....	Iowa.
W. S. Dennet.....	Saco.....	York.....	Maine.
John J. Hubbley.....	Menckannee.....	Marquette.....	Wisconsin.
George Carrington.....	West Winsted.....	Litchfield.....	Connecticut.
Hervey Barber.....	Warwick.....	Franklin.....	Massachusetts.
J. C. Whitmore.....	Cordova.....	Rock Island.....	Illinois.
W. R. Gregg.....	Camden.....	Lyon.....	Minnesota.
C. W. Parsons.....	Providence.....	Providence.....	Rhode Island.
O. A. Archer.....	Blackington.....	Berkshire.....	Massachusetts.
Howard C. Lewis.....	Mount Holly.....	Burlington.....	New Jersey.
W. H. Higgins.....	Grant City.....	Sac.....	Iowa.
J. F. Lewellyn.....	Mexico.....	Audrain.....	Missouri.
O. P. Baer.....	Richmond.....	Wayne.....	Indiana.
Henry J. Grannia.....	High Forest.....	Olmstead.....	Minnesota.
Charles Krehner.....	Waumandee.....	Buffalo.....	Wisconsin.
Clarence Gardner.....	Burlington.....	Des Moines.....	Iowa.
A. H. Peterson.....	Bath.....	Freeborn.....	Minnesota.
H. S. Terry.....	Utica.....	Winona.....	Do.
F. L. Sanford.....	Independence.....	Buchanan.....	Iowa.
R. W. Putnam.....	Ypsilanti.....	Washtenaw.....	Michigan.
J. W. Perkins.....	New Chester.....	Adams.....	Wisconsin.
Alexander Paul.....	Patch Grove.....	Grant.....	Do.
R. P. Colt.....	Poy Sippi.....	Waushara.....	Do.
George S. Card.....	Daisy.....	Hamilton.....	Tennessee.
H. Besse, jr.....	Butternut.....	Ashland.....	Wisconsin.
C. Keeckley.....	Hillsborough.....	Fleming.....	Kentucky.
A. Norellins.....	Kiron.....	Crawford.....	Iowa.
John D. Dopf.....	Rockport.....	Atchison.....	Missouri.
Isaac H. Adams.....	Scranton.....	Green.....	Iowa.
Meessrs. Webster and Corning.....	Briggsville.....	Marquette.....	Wisconsin.
Prof. Henry M. McFarland.....	Hyde Park.....	Lamolle.....	Vermont.
R. J. Spurr.....	Greendale.....	Fayette.....	Kentucky.
Israel S. Scott.....	Kirk's Ferry P. O.....	Catahoula Parish.....	Louisiana.
Edwin L. Childs.....	Crete.....	Saline.....	Nebraska.
J. Sidner, jr.....	Loradale.....	Fayette.....	Kentucky.
Olef Olson.....	Deer Park.....	Saint Croix.....	Wisconsin.
Paul Roulet.....	Drury College, North Springfield.....	Green.....	Missouri.
N. L. Smith.....	Centralla.....	Boone.....	Do.
William H. Pomeroy.....	Edgerton.....	Rock.....	Wisconsin.
James Amy.....	Saint Joseph.....	Tensas.....	Louisiana.
D. W. Briggs.....	Mount Sterling.....	Crawford.....	Wisconsin.
William M. Taylor.....	Herndon.....	Saline.....	Missouri.
G. H. Kallmeyer.....	Best Bottom.....	Montgomery.....	Do.
B. F. Ferris.....	Sunman.....	Ripley.....	Indiana.
W. B. Goodrich.....	Bingham.....	Somerset.....	Maine.
Joseph Luce.....	Pueblo.....	Pueblo.....	Colorado.
Irvine Prather.....	Russell Cave.....	Fayette.....	Kentucky.
W. H. Scofield.....	Cannon River Falls.....	Goodhue.....	Minnesota.
D. P. Davis, jr.....	South Bend.....	Blue Earth.....	Do.
Rev. A. A. Young.....	New Lisbon.....	Juneau.....	Wisconsin.
O. G. Wall.....	Lanesborough.....	Fillmore.....	Minnesota.
M. C. Thompson.....	Waverly.....	Pierce.....	Wisconsin.
E. P. Stearns.....	Etler.....	Dakota.....	Minnesota.
N. B. McKay.....	American City.....	Nemaha.....	Kansas.
P. W. Sears.....	Moravia.....	Appanoose.....	Iowa.
E. Silverberg.....	Peach Orchard.....	Clay.....	Arkansas.
C. G. Parker.....	Mount Vernon.....	Franklin.....	Texas.
T. E. Jenkins.....	Dawn.....	Livingston.....	Missouri.
E. G. Hubbell.....	Pittsfield.....	Berkshire.....	Massachusetts.
E. A. Goodnough.....	Oneida.....	Brown.....	Wisconsin.
H. W. Smith.....	Adair.....	Adair.....	Iowa.
J. C. Hatch.....	Loyd.....	Richland.....	Wisconsin.
T. Jewell.....	Star Prairie.....	Saint Croix.....	Wisconsin.
W. W. Moore.....	Gillett.....	Clay.....	Iowa.
T. A. Smith.....	Beloit.....	Rock.....	Wisconsin.
M. C. Waite.....	Baraboo.....	Sauk.....	Do.
W. E. Hull.....	Prior Lake.....	Scott.....	Minnesota.
E. L. Berthoud.....	Golden.....	Jefferson.....	Colorado.
B. Craig.....	Versailles.....	Woodford.....	Kentucky.
J. G. Lawton.....	De Pere.....	Brown.....	Wisconsin.
S. R. Rittenhouse.....	Reading.....	Berks.....	Pennsylvania.
S. M. Locke.....	Rockbury.....	Oxford.....	Maine.
J. S. Gerald.....	Beaver Falls.....	Henville.....	Minnesota.
August Sweger.....	Avalanche.....	Vernon.....	Wisconsin.
E. J. Gilkey.....	Strong.....	Franklin.....	Maine.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-Office.	County.	State or Territory.
Wilder Pratt	Freeman	Franklin	Maine.
A. Patrick	Grand Marsh	Adams	Wisconsin.
Rachael Larrabee	McGregor	Clayton	Iowa.
G. W. McDonald	Monticello	Wright	Minnesota.
J. J. Palmer	City Point	George	Virginia.
John Janzen	Mountain Lake	Cottonwood	Minnesota.
Arthur J. Carroll	Plainview	Wabasha	Do.
Henry Tucker	Otto	Clark	Indiana.
E. D. Winchester	Stacyville	Mitchell	Iowa.
Reuben Adams	Hersey	Saint Croix	Wisconsin.
William B. Pratt	Prattsburgh	Steuben	New York.
M. F. Billingsley	Franklin	Izard	Arkansas.
H. W. Pickens	Atalla	Etowah	Alabama.
John R. King	Island Lake	Lyon	Minnesota.
W. L. Wilkinson	Tettington	Charles City	Virginia.
E. D. Henry	Omro	Winnebago	Wisconsin.
J. S. Towle	New Avon	Redwood	Minnesota.
T. V. Munson	Dennison City	Grayson	Texas.
T. C. Craig	Easton	Leavenworth	Kansas.
O. Knight	Glendale	Henrico	Virginia.
G. B. Holden	Bacon	Monroe	Wisconsin.
Henry C. Terrell	Elmwood	Saline	Missouri.
William Welsh	Loyal	Clark	Wisconsin.
R. H. Kirk	Oxford	Chester	Pennsylvania.
C. L. Fellows	Fascoro	Kewanee	Wisconsin.
John A. Wood	Rock Branch	Woodbury	Iowa.
William Smith	Marshfield	Webster	Missouri.
M. M. Beck	Holton	Jackson	Kansas.
R. B. Boulton	Millersburgh	Bourbon	Kentucky.
John Ingleby	Potsdam	Olmead	Minnesota.
I. J. Wheeler	Monona	Clayton	Iowa.
J. G. Brandon	Poughkeepsie	Sharp	Arkansas.
Enoch L. Fogg	Woodstown	Salem	New Jersey.
J. L. Stowell	Bell Centre	Crawford	Wisconsin.
R. A. A. Morse	Gainesville	Sumpter	Alabama.
W. R. Allen	Pitman	Clay	Arkansas.
H. B. Wilson	Red Wing	Goodhue	Minnesota.
B. F. Jones	Beauregard	Copiah	Mississippi.
James H. Maxwell	Worthington	Nobles	Minnesota.
C. K. Baxter	Wells	Fairbault	Do.
G. G. Witherspoon	Marystown	Johnson	Texas.
W. B. Clark	Beebe	White	Arkansas.
J. K. Gardner	New Hampton	Chickasaw	Iowa.
D. W. McNeal	Wendell	Cherokee	Do.
J. J. Webb	Fairview	Brown	Kansas.
W. A. Paddock	Ackerland	Leavenworth	Do.
W. D. Akers	Spring Valley	Pierce	Wisconsin.
George Stockmeyer	Fort Scott	Bourbon	Kansas.
H. A. Swain	Union Lake	Rice	Minnesota.
A. Patterson	Lee	Carter	Missouri.
D. L. Beaver	Reading	Berks	Pennsylvania.
J. O. Olen	Freedom	Wasca	Minnesota.
H. C. Rawson	Sturgis	Saint Joseph	Michigan.
Prof. H. E. Sadler	Emporia	Lyon	Kansas.
Edgar W. Clarke	Irvington	Washington	Illinois.
Robert O. Schoenfeleer	Wellington	Renville	Minnesota.
W. G. Bartley	Birch Cooley	do	Do.
A. E. Dolbear	College Hill	Middlesex	Massachusetts.
B. S. Hoxie	Albany	Green	Wisconsin.
F. O. Brauns	Tracy	Lyons	Minnesota.
J. H. Fawcett	Marion	Olmead	Do.
John H. McGillan	Mackville	Outagamie	Wisconsin.
J. W. Dawson	Redfield	Spink	Dakota.
John Antry	Albertha	Randolph	Arkansas.
T. J. Reeves	Seney	Plymouth	Iowa.
P. Clawson	O'Keana	Butler	Ohio.
Arthur Borger	Wilson	Niagara	New York.
Henry M. Crombie	Glasgow	Trempealeau	Wisconsin.
D. F. Akin	Farmington	Dakota	Minnesota.
W. C. Talley	Marble Hill	Bollinger	Missouri.
James A. Shanker	Beaver Creek	Rock	Minnesota.
Martiu Bischoff	Buffalo	Erle	New York.
Henry D. A. Ward	Middletown	Middlesex	Connecticut.
S. W. Morrison	Oxford	Chester	Pennsylvania.
A. P. Jones	Little Wolf	Waupaca	Wisconsin.
E. A. Jones	Massillon	Stark	Ohio.
John L. Meagher	Marysburg	Le Sueur	Minnesota.
Frank Tilton	Green Bay	Brown	Wisconsin.
Charles G. Robinson	Campbellsburg	Washington	Indiana.
Frank J. Wise	Pine Bluff	Jefferson	Arkansas.
M. E. Paynter	Midway	Woodford	Kentucky.
John Alvey	Delavan	Fairbault	Minnesota.
A. W. Green	Greenville	Clay	Iowa.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
Prof. P. K. Pattison	Westfield.....	Chautauqua.....	New York.
C. N. Sawyer.....	Pattersonville.....	Sioux.....	Iowa.
E. C. Hildreth.....	Wheeling.....	Ohio.....	West Virginia.
John C. Whiteside.....	Loutre Island.....	Montgomery.....	Missouri.
Edwin H. Cox.....	Pekin.....	Niagara.....	New York.
Rev. F. M. Eckstein.....	Conception.....	Nodaway.....	Missouri.
Robert Lynn.....	Acton.....	Pembina.....	Dakota.
Charles G. Boernor.....	Vevay.....	Switzerland.....	Indiana.
G. F. Hunter.....	Hawarden.....	Sioux.....	Iowa.
Walter S. Booth.....	Minneapolis.....	Hennepin.....	Minnesota.
Mrs. B. W. Randall.....	Sharon.....	Le Sueur.....	Do.
C. M. Widman.....	Grand Coteau.....	Saint Landry.....	Louisiana.
T. M. Barton.....	Butler.....	Pendleton.....	Kentucky.
C. Shaler Smith.....	Saint Louis.....	Saint Louis.....	Missouri.
George Durkee.....	De Forest.....	Dane.....	Wisconsin.
K. M. Hutchinson.....	Oshkosh.....	Winnebago.....	Do.
J. N. Prouty.....	Humboldt.....	Humboldt.....	Iowa.
William Prescott.....	Bear Valley.....	Wabasha.....	Minnesota.
A. I. Drake.....	Cascade.....	Goodhue.....	Do.
John De Boos.....	Bigelow.....	Nobles.....	Do.
C. H. Honey.....	Kensington.....	Walsh.....	Dakota.
Charles J. Ellis.....	Marinette.....	Marinette.....	Wisconsin.
F. M. Green.....	Whiting.....	Jackson.....	Kansas.
E. Whitcomb.....	Friend.....	Saline.....	Nebraska.
Albert Campbell.....	Adrian.....	Nobles.....	Minnesota.
James Reed.....	Avalon.....	Livingston.....	Missouri.
C. Steffens.....	Fraser.....	Macomb.....	Michigan.
A. Gould.....	Spring Lake.....	Kingsbury.....	Dakota.
John O'Bryan.....	Garfield.....	Jackson.....	Wisconsin.
N. M. Cook.....	729 Eleventh avenue, N. Minneapolis.	Hennepin.....	Minnesota.
D. H. Morgan.....	Albany.....	Green.....	Wisconsin.
R. W. Neff.....	Nevada.....	Mercer.....	Kentucky.
James H. Haight.....	Lowville.....	Columbia.....	Wisconsin.
L. P. Miller.....	High Hill.....	Montgomery.....	Missouri.
George Fairfield.....	Bridgeport.....	Crawford.....	Wisconsin.
W. S. Prather.....	North Vernon.....	Jennings.....	Indiana.
A. D. Bundy.....	Saint Ansgar.....	Mitchell.....	Iowa.
F. Frederick.....	Cross Plains.....	Dane.....	Wisconsin.
J. C. Risk.....	Canton.....	Lewis.....	Missouri.
John H. Brown.....	Fair Water.....	Fond du Lac.....	Wisconsin.
Henry Schildt.....	Mazo Manic.....	Dane.....	Do.
E. F. Lewis.....	Lewiston.....	Columbia.....	Do.
Enma M. Smith.....	Mendota.....	Dane.....	Do.
J. C. Fales.....	Danville.....	Boyles.....	Kentucky.
J. M. Elder.....	Concord.....	Hancock.....	Iowa.
Charles A. Kendall.....	Barry.....	Pike.....	Illinois.
John Regan.....	Elmwood.....	Peoria.....	Do.
Alexander Hawkin.....	West Newton.....	Nicollet.....	Minnesota.
Thomas J. Felzer.....	Enterprise.....	Winona.....	Do.
G. H. Yapp.....	Waucousta.....	Fond du Lac.....	Wisconsin.
Andrew W. Pederson.....	Comfrey.....	Brown.....	Minnesota.
C. H. Benton.....	Dodge Centre.....	Dodge.....	Do.
John Collet.....	Indianapolis.....	Marion.....	Indiana.
J. Shaw.....	Chester.....	Olmstead.....	Minnesota.
Joseph Boyd.....	Oskaloosa.....	Mahaska.....	Iowa.
E. A. Hickman.....	Independence.....	Jackson.....	Missouri.
C. P. Parsons.....	Spaulding.....	Hamlin.....	Dakota.
J. F. Martin.....	Effingham.....	Atholson.....	Kansas.
G. A. Goff, jr.....	Elmira.....	Chemung.....	New York.
George S. Barnes.....	Handy.....	Rock.....	Minnesota.
Erasmus Haworth.....	Oskaloosa.....	Mahaska.....	Iowa.
Nathaniel Shute.....	Exeter.....	Rockingham.....	New Hampshire.
E. Tracy Brown.....	Hanover.....	Rock.....	Wisconsin.
F. H. King.....	River Falls.....	Pierce.....	Do.
A. M. Carter.....	Johnstown.....	Rock.....	Do.
H. M. Weston.....	Greenwood.....	Clark.....	Do.
P. E. Orear.....	Orearville.....	Saline.....	Missouri.
E. Hildebrand.....	Philadelphia.....	Philadelphia.....	Pennsylvania.
Mrs. P. H. Mell.....	Auburn.....	Lee.....	Alabama.
Oscar J. Lawronce.....	Arlington.....	Tarrant.....	Texas.
E. A. Gore.....	Marshall.....	Lyon.....	Minnesota.
Peter Wodzinski.....	Stoddard.....	Vernon.....	Wisconsin.
George R. Cather.....	Ashville.....	Saint Clair.....	Alabama.
C. G. Edwards.....	Spring Valley.....	Fillmore.....	Minnesota.
William J. Waggoner.....	Viola.....	Richland.....	Wisconsin.
E. S. Mitchell.....	Tigerton.....	Shawano.....	Do.
R. S. Morse.....	Beetown.....	Grant.....	Do.
George Davy.....	Ottawa.....	Waukesha.....	Do.
A. F. Berry.....	Springville.....	Lawrence.....	Indiana.
S. N. Kingsley.....	Loganville.....	Sauk.....	Wisconsin.
Mrs. J. Campbell.....	Sibley.....	Osceola.....	Iowa.
John T. Bedally.....	Trim Belle.....	Pierce.....	Wisconsin.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
G. B. Brackett.....	Denmark.....	Lee.....	Iowa.
H. P. Hanson.....	Haywood.....	Freeborn.....	Minnesota.
J. H. J. Williams.....	Doran's Cave.....	Jackson.....	Alabama.
E. F. Test.....	Omaha.....	Douglas.....	Nebraska.
Spencer Haines.....	Ranocosa.....	Burlington.....	New Jersey.
James B. Wallace.....	Mount Pleasant.....	Westmoreland.....	Pennsylvania.
J. Reimers.....	Calumet Harbor.....	Fond du Lac.....	Wisconsin.
Abraham Vines.....	Vine's Springs.....	Ripley.....	Indiana.
J. B. Porter.....	Silver Creek.....	Floyd.....	Georgia.
W. B. Strong.....	Northfield.....	Rice.....	Minnesota.
Daniel James.....	Yarnallton.....	Fayette.....	Kentucky.
E. M. Shepard.....	Springfield.....	Green.....	Missouri.
Robert Severs.....	Washington Harbor.....	Door.....	Wisconsin.
Ellwood Cooper.....	Santa Barbara.....	Santa Barbara.....	California.
Edward Newhouse.....	Edwards.....	Sheboygan.....	Wisconsin.
C. Bonnin.....	Bondnet.....	Shawano.....	Do.
L. Stowe.....	Sun Prairie.....	Dane.....	Do.
J. T. Davenport.....	Whitesburg.....	Carroll.....	Georgia.
Thomas L. Wakeley.....	Germania.....	Calhoun.....	Alabama.
J. J. B. McElrath.....	Centre.....	Cherokee.....	Do.
E. R. Memminger.....	17 Broad st., Charles- ton.....	Charleston.....	South Carolina.
Colin Macrar.....	Camden.....	Kershaw.....	Do.
J. S. Stewart.....	Oxford.....	Newton.....	Georgia.
R. L. Rhodes.....	Hephisibah.....	Richmond.....	Do.
Henry D. Capers.....	Adairsville.....	Barton.....	Do.
W. M. Chapel.....	Kingston.....	Green Lake.....	Wisconsin.
George H. Larison.....	Lambertville.....	Hunterton.....	New Jersey.
K. C. Pope.....	Battleborough.....	Edgecombe.....	North Carolina.
George L. De Hines.....	Hope Station.....	Lexington.....	South Carolina.
E. Parsons.....	Dallas.....	Gaston.....	North Carolina.
T. G. Patrick.....	White Oak.....	Fairfield.....	South Carolina.
H. F. Walker.....	Jackson Station.....	Aiken.....	Do.
John T. Hardie.....	67 Carondelet street.....	New Orleans.....	Louisiana.
Levi Clippinger.....	Centralia.....	Nemaha.....	Kansas.
Albert Rawlins.....	Eastland.....	Eastland.....	Texas.
A. J. Laing.....	Dale.....	Cottonwood.....	Minnesota.
J. H. Brownlee.....	Plainsville.....	Gordon.....	Georgia.
John Minor.....	Sun Hill.....	Washington.....	Do.
John C. Glover.....	Batesburg.....	Lexington.....	South Carolina.
W. F. Brewer.....	Duluth.....	Gwinnett.....	Georgia.
Mary R. Dusenbery.....	Concord.....	Cabarrus.....	North Carolina.
G. P. Harley.....	Allendale.....	Barnwell.....	South Carolina.
W. H. Hatfield.....	Hollywood.....	Richland.....	Georgia.
D. L. Cheatham.....	Davidaborough.....	Washington.....	Do.
Trace G. Cochran.....	Anderson.....	Anderson.....	South Carolina.
J. M. Bivins.....	Albemarle.....	Hanley.....	North Carolina.
W. J. Goss.....	Harmony Grove.....	Jackson.....	Georgia.
F. McRae.....	Wadesborough.....	Anson.....	North Carolina.
James E. Crossland.....	Aiken.....	Aiken.....	South Carolina.
V. B. Clark.....	Blountsville.....	Jones.....	Georgia.
L. Holt.....	Slurra.....	Shelby.....	Alabama.
N. A. Whitmore.....	Canton.....	Cherokee.....	Georgia.
J. K. Milner.....	Columbiana.....	Shelby.....	Alabama.
James Smith.....	Lexington.....	Davidson.....	North Carolina.
D. A. Jordan.....	Jackson.....	Northampton.....	Do.
William T. Hamilton.....	Talking Rock.....	Pikens.....	Georgia.
E. Rumble.....	Gogginsville.....	Monroe.....	Do.
Rampson Pope.....	Newberry.....	Newberry.....	South Carolina.
W. C. Rose.....	Timmonsville.....	Darlington.....	Do.
John H. Frick.....	Warrenton.....	Warren.....	Missouri.
J. M. Pugh.....	Morrisville.....	Wake.....	North Carolina.
O. S. Jones.....	Manly.....	Moore.....	Do.
Thomas W. Halloway.....	Pomaria.....	Newberry.....	South Carolina.
James A. Dunlap.....	Cedar Hill.....	Anson.....	North Carolina.
Mrs. H. N. Sutton.....	Big Creek.....	Forsyth.....	Georgia.
M. H. Allen.....	Beverly.....	Anson.....	North Carolina.
J. H. Hendly.....	Ansonville.....	Anson.....	Do.
H. H. Guernsey.....	Altamont.....	Deuel.....	Dakota.
D. F. Waite.....	Byron.....	Houston.....	Georgia.
E. A. S. Mixon.....	Barnwell.....	Barnwell.....	South Carolina.
James H. Paw.....	Smithfield.....	Johnston.....	North Carolina.
L. H. Boyken.....	Brooks' Station.....	Fayette.....	Georgia.
T. J. Gray.....	Choctaw Agency.....	Oktibbeha.....	Mississippi.
Dr. William W. Twitty.....	Camilla.....	Mitchell.....	Georgia.
Professor J. E. Davies.....	Madison.....	Dane.....	Wisconsin.
J. N. Garrison.....	Gillsville.....	Banks.....	Georgia.
W. W. Crosby.....	Crosbyville.....	Chester.....	South Carolina.
John W. Lutz.....	Cave Springs.....	Bullitt.....	Kentucky.
R. A. Gohar.....	Dougherty.....	Dawson.....	Georgia.
H. I. Irby.....	Linton.....	Hancock.....	Do.
C. Lightfoot.....	Pellham.....	Mitchell.....	Do.
W. J. Y. Thurston.....	Clayton.....	Johnston.....	North Carolina.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
A. M. McMullen.....	Landsford.....	Chester.....	South Carolina.
Richard L. Rowe.....	Rock Valley.....	Sioux.....	Iowa.
J. A. Parham.....	Lockville.....	Chatham.....	North Carolina.
R. B. McArver.....	Cocoa.....	Floyd.....	Georgia.
William M. Jones.....	Cary.....	Wake.....	North Carolina.
J. C. Goodman.....	Goodman.....	Anson.....	Do.
J. S. Stewart, Jr.....	Cave Spring.....	Floyd.....	Georgia.
Jackson Counts.....	Peak.....	Lexington.....	South Carolina.
B. F. Benton.....	Raymond.....	Union.....	North Carolina.
C. C. Chandler.....	Bascobel.....	Jackson.....	Georgia.
Alexander A. Beard.....	Wilsonville.....	Spencer.....	Kentucky.
W. C. Baskins.....	Coats Bend.....	Etowah.....	Alabama.
C. Martin.....	Martin's Cross Roads.....	Calhoun.....	Do.
A. S. Marsh.....	Harrisburg.....	Saline.....	Illinois.
Charles De St. Roseana.....	Augusta.....	Richmond.....	Georgia.
James McFarlane.....	Toxanda.....	Bradford.....	Pennsylvania.
J. M. Head, Jr.....	Linwood.....	Pike.....	Alabama.
W. B. Spencer.....	Murfreesborough.....	Hertford.....	North Carolina.
S. Pierson.....	Enfield.....	Halifax.....	Do.
P. J. Blackwell.....	Lavonia.....	Franklin.....	Georgia.
W. Nelson.....	Smith's Turn Out.....	York.....	South Carolina.
John Goodrich.....	Enfield.....	Halifax.....	North Carolina.
W. F. Watson.....	Watsonville.....	Rowan.....	Do.
R. C. Alexander.....	Homer.....	Banks.....	Georgia.
R. M. Raymond.....	Halles Gold Mine.....	Lancaster.....	South Carolina.
J. M. Campbell.....	Oak Grove.....	Union.....	North Carolina.
Henry S. Glover.....	Monticello.....	Jasper.....	Georgia.
W. B. Smith.....	Tumbling Shoals.....	Laurens.....	South Carolina.
Marvel Ritchie.....	Copal Grove.....	Stanley.....	North Carolina.
M. F. Huntley.....	Lane's Creek.....	Union.....	Do.
J. T. Rose.....	Indian Trail.....	do.....	Do.
S. Buckley.....	New Providence.....	Montgomery.....	Tennessee.
Arthur Harvin.....	Oakland.....	Clarendon.....	South Carolina.
C. W. Stanton.....	Elk City.....	Montgomery.....	Kansas.
R. J. Harper.....	Sandy Ridge.....	Henry.....	Georgia.
W. H. S. Harris.....	Jonesville.....	Union.....	South Carolina.
G. H. Hannah.....	South Bosque.....	McLennan.....	Texas.
James C. Klugh.....	Abbeville.....	Abbeville.....	South Carolina.
J. W. Majors.....	Majors.....	Anderson.....	Do.
J. J. Talley.....	Lovelace.....	Troup.....	Georgia.
Ansel Strickland.....	Cummings.....	Forsyth.....	Do.
Thad C. Sturgis.....	Columbus.....	Muscogee.....	Do.
Chas. Nickerson.....	Big Creek.....	Edgefield.....	South Carolina.
John W. Caldwell.....	Clarksville.....	Montgomery.....	Tennessee.
J. A. Keller.....	Tunnel Hill.....	Hardin.....	Kentucky.
C. E. Beasey.....	Ames.....	Storey.....	Iowa.
Edward B. Smith.....	Smithsborough.....	Jasper.....	Georgia.
I. Varenberg.....	Paint Rock.....	Jackson.....	Alabama.
H. Good.....	Marietta.....	Greenville.....	South Carolina.
J. M. Dorsey.....	Massey Creek.....	White.....	Georgia.
R. W. Boyd.....	Darlington.....	Darlington.....	South Carolina.
Thos. B. Dedrer.....	Little Warrior.....	Blount.....	Alabama.
Edgar L. Larkin.....	New Windsor.....	Mercer.....	Illinois.
James O. Ladd.....	Cheraw.....	Chesterfield.....	South Carolina.
B. C. Smith.....	Cold Water.....	Elbert.....	Georgia.
I. A. Ledbetter.....	Edinborough.....	Montgomery.....	North Carolina.
W. F. Brookshine.....	Powelson.....	Richmond.....	Do.
E. W. Griffith.....	Ozark.....	Dale.....	Alabama.
L. M. Burkett.....	Pine Ridge.....	Twiggs.....	Georgia.
T. W. Methvin.....	Senola.....	Coweta.....	Do.
P. D. Huff.....	Saint Albans.....	Greenville.....	South Carolina.
J. R. Culp.....	Rossville.....	Chester.....	Do.
William Geaner.....	Birmingham.....	Jefferson.....	Alabama.
William Bradley.....	Mapleton.....	Abbeville.....	South Carolina.
C. E. Greene.....	Long Cane.....	Troup.....	Georgia.
J. J. Bunch.....	Poverty Hill.....	Edgefield.....	South Carolina.
D. C. Hodo.....	Carrollton.....	Pickens.....	Alabama.
W. H. Jones.....	Ringwood.....	Halifax.....	North Carolina.
Charles S. Prosser.....	Ithaca.....	Tompkins.....	New York.
P. P. Maxwell.....	Davidson College.....	Mecklenburgh.....	North Carolina.
John M. Vean.....	Nellisville.....	Clark.....	Wisconsin.
George H. Carter.....	Carter's Mills.....	Moore.....	North Carolina.
Charles D. Chappell.....	Jenkinsville.....	Fairfield.....	South Carolina.
W. T. Holland.....	Marion Station.....	Lauderdale.....	Mississippi.
H. D. Ingersoll.....	Dahlonega.....	Lumpkin.....	Georgia.
C. B. La Hatté.....	Gainesville.....	Hall.....	Do.
R. P. Collins.....	Hannahan.....	Pitt.....	North Carolina.
W. S. Sanford.....	Livingston.....	Floyd.....	Georgia.
Jer. S. Bray.....	Foust's Mills.....	Randolph.....	North Carolina.
D. H. Hepler.....	Hannersville.....	Davidson.....	Do.
W. P. Coker.....	Cedar Grove.....	Laurens.....	South Carolina.
J. B. Wright.....	High Tower.....	Forsyth.....	Georgia.
Jacob W. Whorton.....	Forney.....	Cherokee.....	Alabama.

List of tornado reporters, June 30, 1885—Continued.

Names.	Post-office.	County.	State or Territory.
Josiah E. Pridgen.....	Key.....	Cherokee.....	Alabama.
John B. Boyd.....	Sonora.....	Gordon.....	Georgia.
George B. Tillton.....	Aurora.....	Kane.....	Illinois.
Irvin F. Smith.....	Lansing.....	Ingham.....	Michigan.
J. A. Salter.....	Crawford.....	Lowndes.....	Mississippi.
W. A. Ellington.....	Beaumont.....	Chatham.....	North Carolina.
James L. Strain.....	Etta Jane.....	Union.....	South Carolina.
E. E. Barnard.....	Vanderbilt Univer- sity.....	Nashville.....	Tennessee.
T. J. Lake.....	Athens.....	Limestone.....	Alabama.
A. J. Phinney.....	Muncie.....	Delaware.....	Indiana.
F. J. Hay.....	Liberty Hill.....	Kershaw.....	South Carolina.
W. T. McGlothlin.....	Richland Station.....	Sumner.....	Tennessee.
G. P. Lloyd.....	Winfred.....	Jasper.....	Georgia.
J. S. Wright.....	Duncans.....	Spartanburgh.....	South Carolina.
J. M. Dill.....	Clay Hill.....	Lincoln.....	Georgia.
W. T. Henderson.....	Coronaca.....	Abbeville.....	South Carolina.
Samuel D. McGill.....	Camp Ridge.....	Williamsburgh.....	Do.
W. M. Dalton.....	Dido.....	Choctaw.....	Mississippi.
John N. Miller.....	Glenn Springs.....	Spartanburgh.....	South Carolina.
William A. Love.....	Crawford.....	Lowndes.....	Mississippi.
J. F. Smith.....	Cedar Grove.....	Walker.....	Georgia.
W. J. Taylor.....	Cloverdale.....	Dade.....	Do.
J. W. Rosamond.....	Brushy Creek.....	Anderson.....	South Carolina.
C. D. Williamson.....	Big Oak.....	Moore.....	North Carolina.
George D. Norris.....	New Market.....	Madison.....	Alabama.
Henry D. Bennett.....	Guntersville.....	Marshall.....	Do.
I. E. Goodgion.....	Goodgion's Factory.....	Laurens.....	South Carolina.
B. F. Grady.....	Albertsons.....	Duplin.....	North Carolina.
A. P. Murray.....	Albany.....	Delaware.....	Indiana.
I. D. Love.....	Oktibbeha.....	Oktibbeha.....	Mississippi.
H. Benedict.....	Springport.....	Henry.....	Indiana.
Frank Burns.....	Blountsville.....	Blount.....	Alabama.
John S. Walser.....	Riches.....	Sauk.....	Wisconsin.
C. L. Williams, jr.....	Nacoochee.....	White.....	Georgia.
J. W. Each.....	Holland's Store.....	Anderson.....	South Carolina.
I. R. Littlejohn.....	Asbury.....	Union.....	Do.
Silas C. Turnbo.....	Protem.....	Taney.....	Missouri.
J. W. Sessoms.....	Bethlehem.....	Hertford.....	North Carolina.
I. L. Guthridge.....	Mingo.....	Champaign.....	Ohio.
C. G. Wilson.....	Milledgeville.....	Baldwin.....	Georgia.
James A. Garvin.....	Newton.....	Catawba.....	North Carolina.
James H. Bishop.....	Beulaville.....	Duplin.....	Do.
W. A. Montgomery.....	Cross Plains.....	Calhoun.....	Alabama.
J. W. Gore.....	Chapel Hill.....	Orange.....	North Carolina.
John McColn.....	Stratford.....	Greene.....	Missouri.
W. B. King.....	Black-Jack.....	Robertson.....	Tennessee.
G. J. N. Wilson.....	Jefferson.....	Jackson.....	Georgia.
J. A. Roberts.....	Campbell.....	Knox.....	Tennessee.
C. H. Egolf.....	Etna.....	Licking.....	Ohio.
K. T. Daniell.....	Cross Plains.....	Calhoun.....	Alabama.
Seaborn Kitchens.....	Gibson.....	Glascok.....	Georgia.
J. M. Henderson.....	Stout.....	Union.....	North Carolina.
J. S. Renninger.....	Minnesota.....	Lyon.....	Minnesota.
Charles Ambrose, jr.....	Millersport.....	Fairfield.....	Ohio.
W. C. Barkin.....	Coats Bend.....	Etowah.....	Alabama.
J. E. Willet.....	Macon.....	Bibb.....	Georgia.
Charles A. Beam.....	Beamville.....	Allegheny.....	Pennsylvania.
G. B. Telford.....	Grove Level.....	Banks.....	Georgia.
William F. Hoy.....	Millville.....	Spartanburgh.....	South Carolina.
William Riley.....	Ohio.....	Anderson.....	Do.
B. F. Grigg.....	Lincolnton.....	Lincoln.....	North Carolina.
A. J. McCall.....	Bath.....	Steuben.....	Do.
Charles Moore.....	Pottstown.....	Montgomery.....	Pennsylvania.
A. Sharpless.....	West Chester.....	Chester.....	Do.
J. N. Smith.....	Mount Summit.....	Henry.....	Indiana.
C. M. Hunt.....	Gamble's Store.....	Rutherford.....	North Carolina.
L. M. Werts.....	Clouds Creek.....	Edgefield.....	South Carolina.
W. H. Pratt, secretary Acad- emy of Natural Science.	Davenport.....	Sqott.....	Iowa.
F. E. Jerome.....	Russell.....	Russell.....	Kansas.
John Covert.....	Oregon.....	Clark.....	Indiana.
John E. Shaffer.....	Fairfield.....	Jefferson.....	Iowa.
F. E. Charlesworth.....	Ledyard.....	Outagamie.....	Wisconsin.
A. T. Fuller.....	Hogansville.....	Troup.....	Georgia.
M. W. Coulter.....	Columbus.....	Cherokee.....	Kansas.
T. F. Warner.....	Platte City.....	Platte.....	Missouri.
A. B. Braydon.....	Monroe.....	Monroe.....	Michigan.
Frank P. Hall.....	Edina.....	Knox.....	Missouri.
S. A. Day.....	Oswatimole.....	Miami.....	Kansas.
Geo. Ware.....	Washington.....	Wilkes.....	Georgia.
Miss E. Foster.....	Newton.....	Sussex.....	New Jersey.
Martin Clark.....	Sutton.....	Clay.....	Nebraska.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
A. S. Currey	Trenton.....	Gibson.....	Tennessee.
A. M. Gibson.....	Chepultepec.....	Blount.....	Alabama.
A. D. Cadwallader.....	Lincoln.....	Logan.....	Illinois.
W. B. Jones.....	Herndon.....	Burke.....	Georgia.
D. W. Brainard.....	Grinnell.....	Poweshiek.....	Iowa.
J. W. Grossbeck.....	Harvard.....	McHenry.....	Illinois.
Alfred S. Franklin.....	Covington.....	Newton.....	Georgia.
James Seaborn.....	Fair Play.....	Oconee.....	South Carolina.
D. C. Neff.....	Day.....	Clark.....	Wisconsin.
T. B. Headford.....	Essexville.....	Bay.....	Michigan.
W. M. Owen.....	Crothersville.....	Jackson.....	Indiana.
T. J. Painter.....	Connessauga.....	Murray.....	Georgia.
W. S. Ruckel.....	De Witt.....	Carroll.....	Missouri.
I. A. Ward.....	Troy.....	Lincoln.....	Do.
W. C. Stovall.....	Rock Mart.....	Polk.....	Georgia.
L. M. Putnam.....	Swain.....	Spartanburg.....	South Carolina.
A. B. Woodruff.....	Woodruffs.....	do.....	Do.
James S. Robinson.....	Willington.....	Abbeville.....	Do.
A. P. Trautwein.....	Office of Continental Works.	Greenpoint.....	New York.
W. A. Battalle.....	Mobile.....	Mobile.....	Alabama.
J. W. Knight.....	Racine.....	Racine.....	Wisconsin.
J. R. Spencer.....	Arilla.....	Jasper.....	Missouri.
Prof. C. P. Conrad.....	Fayetteville.....	Washington.....	Arkansas.
S. E. Hoeker.....	Georgetown.....	Ottawa.....	Kansas.
Dr. S. B. Bowles.....	Greenfield.....	Dade.....	Missouri.
Robert Woody.....	Crayton.....	Fannin.....	Georgia.
Dr. R. C. Kedgie.....	Agricultural College.....	Lansing.....	Michigan.
H. H. Clayton.....	Murfreesborough.....	Rutherford.....	Tennessee.
J. F. Hopkins.....	Mabelvale.....	Pulaski.....	Arkansas.
B. H. Sellmeyer.....	Knobel.....	Clay.....	Do.
J. R. Woodfill.....	Verona.....	Lawrence.....	Missouri.
J. W. Ingles.....	Pleasant Hill.....	Saline.....	Nebraska.
Dr. James Davis.....	Kellory.....	Wabasha.....	Minnesota.
W. R. Lesser.....	Tama City.....	Tama.....	Iowa.
Samuel R. Weed.....	Wabauusee.....	Wabauusee.....	Kansas.
E. D. Springer.....	South Creek.....	Beaufort.....	North Carolina.
W. T. Boyse.....	Long Branch.....	Saline.....	Illinois.
H. Eastland.....	Forest.....	Scott.....	Mississippi.
Lee S. Cobb.....	Onondaga.....	Ingham.....	Michigan.
A. E. McGoffin.....	Lyons.....	Rice.....	Kansas.
B. B. Barry.....	Pollocksville.....	Jones.....	North Carolina.
A. W. Wilmarth.....	Embarrase.....	Waupeca.....	Wisconsin.
E. S. Griffin.....	Rices.....	Pickens.....	South Carolina.
H. D. Olds.....	Cedar Rapids.....	Linn.....	Iowa.
Stephen Chapman.....	Bloomfield.....	Stoddard.....	Missouri.
John L. Tunnell.....	Ozark.....	Christian.....	Do.
Rev. Ira R. Hicks.....	Pinkville, West Saint Louis.	Saint Louis.....	Do.
C. J. Bayer.....	Saint Louis.....	Linn.....	Iowa.
J. M. Martin.....	Cedar Rapids.....	Alcorn.....	Mississippi.
Dr. Frank Prince.....	Corinth.....	Jefferson.....	Alabama.
William Dunlap.....	Jonesborough.....	Saint Clair.....	Do.
W. C. Mathews.....	Wolf Creek.....	Washington.....	Georgia.
G. W. Clements.....	Tennille.....	Calhoun.....	Alabama.
S. A. Harris.....	De Armanville.....	Hallfax.....	North Carolina.
William A. McCresless.....	Dawson's Cross R'ds.	Marshall.....	Alabama.
Benjamin F. Dorsey.....	Albertville.....	Pickens.....	Georgia.
Benjamin P. Berry.....	Jasper.....	Blount.....	Alabama.
R. A. Rouse.....	Brownsville.....	Williamsburgh.....	South Carolina.
D. A. Montgomery.....	Scranton.....	Green.....	Alabama.
J. H. Spote.....	Pleasant Ridge.....	Darlington.....	South Carolina.
F. H. Dover.....	Stokes Bridge.....	York.....	Do.
William W. Kinezey.....	Whitaker.....	Gilmer.....	Georgia.
J. J. A. Sharp.....	Diamond.....	Cherokee.....	Do.
H. C. Moore.....	Walesco.....	Bibb.....	Do.
H. T. Bernes.....	Macon.....	Butts.....	Do.
W. K. Sharp.....	Worthville.....	Anderson.....	South Carolina.
W. E. Manning.....	Townville.....	Nash.....	North Carolina.
George Wilcox.....	Spring Hope.....	Moore.....	Do.
G. E. Weber.....	Carbonton.....	Lee.....	Alabama.
R. T. Rush.....	Opelika.....	Montgomery.....	North Carolina.
H. D. Mason.....	Harrisville.....	Chatham.....	Do.
E. C. Smith.....	William's Mills.....	Jefferson.....	Alabama.
Augustus H. Erwin.....	Toad Vine.....	Lumpkin.....	Georgia.
John G. Finley.....	Grace.....	Calhoun.....	Alabama.
W. J. Bell.....	Bruner.....	Spartanburgh.....	South Carolina.
J. B. Jones.....	Gaffney City.....	Burke.....	Georgia.
W. A. Spencer.....	Herndon.....	Laurel.....	Kentucky.
John H. Dent.....	Peoples.....	Floyd.....	Georgia.
S. A. Gregg, Jr.....	Cave Spring.....	Marion.....	South Carolina.
John F. Bishop.....	Mars Bluff.....	Jackson.....	Alabama.
George A. Vance.....	Woodville.....	Labette.....	Kansas.
	Mound Valley.....		

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
Sylvester Flagler	Whitehall	Trempealeau	Wisconsin.
J. B. Britton	Pine Log	Barlow	Georgia.
H. G. Reed	Anderson	Anderson	South Carolina.
J. M. Robertson	Laurens	Laurens	Do.
S. E. Freeland	Plum Branch	Edgefield	Do.
B. H. McEckron	Concordia	Cloud	Kansas.
Paul Quattlebaum	Leesville	Lexington	South Carolina.
H. C. Russell	Eufaula	Barbour	Alabama.
Col. George H. Faribault	Archer Lodge	Johnston	North Carolina.
George E. Lodsham	Pacolet	Spartanburgh	South Carolina.
A. E. Sturgis	Thompson	McDuffie	Georgia.
W. A. McLane	Abbeville	Wilcox	Georgia.
B. Niblack	Virgil	Jackson	Do.
S. E. McMillan	Tabernacle	Marion	South Carolina.
L. C. Coulson	Scottsborough	Jackson	Alabama.
J. S. Jossey	Maynard	Monroe	Georgia.
J. H. Stephenson	Flat Rock	Kershaw	South Carolina.
G. V. Young	Waverly	Clay	Mississippi.
Isaac T. Wilson	Trenton	Jones	North Carolina.
Dr. G. G. Whitcomb	Ogretta	Cherokee	Do.
G. A. Tike	Damascus	Spartanburgh	South Carolina.
James G. Van Frank	Kasson	Dodge	Minnesota.
W. A. Hunter	Hunters	Abbeville	South Carolina.
T. P. G. Campbell	Trenton	Smith	Mississippi.
I. F. Caveness	Buffalo Ford	Randolph	North Carolina.
L. S. Fuller	Lisbon	Laurens	South Carolina.
Dr. John M. Surface	Lake City	Jackson	Missouri.
J. Frank Folger	Pickens C. H.	Pickens	South Carolina.
T. A. Bereman	Mount Pleasant	Henry	Iowa.
J. Shuster	Farmersville	Union	Louisiana.
S. O. Middleton	Hallsville	Duplin	North Carolina.
T. J. Cowden	Grief	Bradley	Tennessee.
H. Edmund Ravenel	Keowee	Oconee	South Carolina.
John Inman	Somerset	Pulaski	Kentucky.
K. Robertson	Mountain Home	Baxter	Arkansas.
Ignatius F. Reese	Oneal	Greenville	South Carolina.
William Bell	Osage	Mitchell	Iowa.
Dr. D. W. Dunn	Chataqua	Chataqua	Kansas.
Robert L. Steele	Rockingham	Richmond	North Carolina.
Dr. E. T. McSwain	Cross Hill	Laurens	South Carolina.
B. Bowers	Bowersville	Hart	Georgia.
W. August Fonda	Carroll	Carroll	Iowa.
Jos. Cohen	Alfonse	Madison	Indiana.
Thomas Dalton	Green Mount	Laurel	Kentucky.
W. F. Houseal	Little Mountain	Lexington	South Carolina.
Z. D. Smith	Zadoc	York	Do.
Amasa Cobb	Beloit	Mahoning	Ohio.
William Curry	Blue Hill	Webster	Nebraska.
A. C. McIntosh	Taylorsville	Alexander	North Carolina.
H. L. Seib	Hamburg	Saint Charles	Missouri.
John T. Camp	Gillsville	Hall	Georgia.
D. R. Elkin	Aiston	Fairfield	South Carolina.
M. H. Ganong	Fort Atkinson	Jefferson	Wisconsin.
George W. Johnson	Campaigne	Towns	Georgia.
Jos. Haberthier	Bridgeport	Warren	Missouri.
J. O. Perry	Troup Factory	Troup	Georgia.
N. S. Whitney	Edwardsville	Madison	Illinois.
Robert A. Wood	Woodburn	Macoupin	Do.
Hunter & Robinson	Belton	Bell	Texas.
W. F. Manuel	Mortonsville	Woodford	Kentucky.
A. Cookendarfer	Berlin	Bracken	Do.
Dr. A. M. Bourland	Van Buren	Crawford	Arkansas.
C. W. Stanton	Elk City	Montgomery	Kansas.
Dr. I. Humphrey	Fairbury	Jefferson	Nebraska.
Prof. J. H. Cook	Columbus	Cherokee	Kansas.
F. W. Doe	Claremont	Dodge	Minnesota.
Dr. J. W. Jacobs	Mount Hor	Bracken	Kentucky.
D. D. Parry	Monmouth	Warren	Illinois.
A. O. McCreery	Wetmore	Nemaha	Kansas.
Prof. A. Howell	White Plains	Greene	Georgia.
G. P. Clarke	Decatur	Newton	Mississippi.
W. F. Hill	Mountaintown	Gilmer	Georgia.
Dr. S. Laning	Kingman	Kingman	Kansas.
J. P. D. Murphy	Bear Creek	Randolph	Alabama.
Otis Ashmore	Harlem	Columbia	Georgia.
Dr. R. Hicks	Hickville	Rutherford	North Carolina.
J. B. Dickson	Locust Grove	Henry	Georgia.
M. D. Kirk	Sturgis	Saint Joseph	Michigan.
I. Ash	Alexander	Pulaski	Arkansas.
G. B. Cowley	Glasville	Caldwell	Missouri.
I. M. Peeler	Pine Grove	Union	South Carolina.
N. W. Kuhn	Appleton	Pope	Arkansas.
Henry Little	Kalamazoo	Kalamazoo	Michigan.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
T. A. McAlister.....	Calhoun's Mills.....	Abbeville.....	South Carolina.
P. J. N. Wilson.....	Jefferson.....	Jackson.....	Georgia.
W. D. Humphrey.....	Isney.....	Choctaw.....	Alabama.
B. A. Strange.....	Ellaville.....	Schley.....	Georgia.
J. W. Edwards.....	Woodstock.....	Cherokee.....	Do.
N. W. Bouton, M. D.....	Ashland.....	Benton.....	Mississippi.
W. C. Bookin.....	Coat's Bend.....	Etowah.....	Alabama.
L. Shaucke.....	Dell.....	Fairbault.....	Minnesota.
Albert G. Williams.....	Blue Spring.....	Jackson.....	Missouri.
B. F. O'Kelly.....	Planter.....	Madison.....	Georgia.
M. P. White.....	Whiton.....	De Kalb.....	Alabama.
A. P. Sims.....	Morton.....	Scott.....	Mississippi.
Wesley Ohl.....	West Austintown.....	Mahoning.....	Ohio.
J. K. Allen.....	Alliance.....	Stark.....	Do.
W. F. Rice.....	Draper.....	Jasper.....	Iowa.
Benjamin Morgan.....	Richland.....	Keokuk.....	Do.
Charles L. Davis.....	Warm Springs.....	Meriwether.....	Georgia.
N. E. Goldthwait.....	Boone.....	Boone.....	Iowa.
Charles Lonsdale.....	Dale City.....	Guthrie.....	Do.
S. Cary.....	Saratoga.....	Winona.....	Minnesota.
S. H. Rouit.....	Rural Vale.....	Whitfield.....	Georgia.
James E. McNair.....	Webb City.....	Jasper.....	Missouri.
Benjamin Hunt.....	Eatonton.....	Putnam.....	Georgia.
S. S. Lindler.....	Pine Ridge.....	Lexington.....	South Carolina.
Link Sanders.....	Honey Creek.....	Henry.....	Indiana.
Dr. H. C. Mathis.....	Taylorsville.....	Spencer.....	Kentucky.
J. W. Livingston.....	Seneca.....	Oconee.....	South Carolina.
Rev. C. Foster Williams.....	Hoffman.....	Maury.....	Tennessee.
Preston J. Clarke.....	Rockpile.....	Dawson.....	Georgia.
C. H. Andrew.....	Fort Lamar.....	Madison.....	Do.
J. P. Bain.....	Texas City.....	Saline.....	Illinois.
J. L. Wilson.....	Bairdstown.....	Oglethorpe.....	Georgia.
Mrs. M. B. McConnell.....	Black Mingo.....	Williamsburg.....	South Carolina.
Dr. P. H. Mayo.....	Falkland.....	Pitt.....	North Carolina.
F. B. Sawvel.....	Canfield.....	Mahoning.....	Ohio.
T. B. Nees.....	Hartford.....	Lyon.....	Kansas.
H. A. Blakely.....	Auburn.....	Gwinnett.....	Georgia.
D. B. Feaster.....	Feasterville.....	Fairfield.....	South Carolina.
J. A. Walther.....	Winton.....	Northford.....	North Carolina.
A. B. Grover.....	Mitchell.....	Robertson.....	Tennessee.
Joseph M. Graham.....	Skye.....	Richmond.....	North Carolina.
Elias Casper.....	Cobb.....	Shelby.....	Alabama.
John W. Jones.....	Corral Hill.....	Barren.....	Kentucky.
G. W. P. Carr.....	Tazewell.....	Marion.....	Georgia.
Albert P. Leisser.....	Browns.....	Dallas.....	Alabama.
W. H. D. Brown.....	Reid.....	Greenville.....	South Carolina.
John Reynolds.....	Mayfield.....	Hancock.....	Georgia.
Thomas R. Davis.....	Price's Mill.....	Union.....	North Carolina.
Richard C. Young.....	Winchester.....	Jefferson.....	Kansas.
Lewis Lowe.....	Pleasant Mount.....	Montgomery.....	Tennessee.
S. W. Terrell.....	Folesville.....	Wake.....	North Carolina.
W. C. McBrayer.....	Draketown.....	Haralson.....	Georgia.
Hon. W. H. McClure.....	Hayesville.....	Clay.....	North Carolina.
Dr. J. M. Lyle.....	Franklin.....	Macon.....	Do.
N. G. Phillips.....	Robbinsville.....	Graham.....	Do.
D. A. Collins.....	Charleston.....	Swayne.....	Do.
Hon. James W. Terrill.....	Webster.....	Jackson.....	Do.
Hon. M. C. King.....	Murphy.....	Cherokee.....	Do.
Capt. C. H. Messenger.....	Asheville.....	Buncombe.....	Do.
Prof. J. A. Davis.....	Watahula.....	Franklin.....	Arkansas.
T. H. Rankin.....	Berry.....	Harrison.....	Kentucky.
J. W. Gifford.....	Dansville.....	Ingham.....	Michigan.
J. F. Smith.....	Cedar Grove.....	Walker.....	Georgia.
Matt. T. Baptiste.....	West Point.....	Clay.....	Mississippi.
T. W. Florer.....	Waxahachie.....	Ellis.....	Texas.
Arthur Dransfield.....	New Harmony.....	Posey.....	Indiana.
John F. Cotton.....	Flagtown.....	Montgomery.....	North Carolina.
J. M. Anderson.....	Cowan.....	Delaware.....	Indiana.
A. H. Harlan.....	New Burlington.....	Clinton.....	Ohio.
Dr. A. C. Halbert.....	Cobb Switch.....	Lowndes.....	Mississippi.
A. H. Peffy.....	Arcanum.....	Darke.....	Ohio.
Dr. R. M. Cotton.....	Tyndall.....	Bon Homme.....	Dakota.
George B. Bard.....	Symco.....	Waupaca.....	Wisconsin.
Frank Pease.....	Silver City.....	Montgomery.....	Arkansas.
P. C. Bluhm.....	Smithville.....	De Kalb.....	Tennessee.
C. C. Gossett.....	Cain's Store.....	Pulaski.....	Kentucky.
A. B. Etienne.....	Centreville.....	Saint Mary's.....	Louisiana.
J. B. Herndon.....	Keysburgh.....	Logan.....	Kentucky.
Allen White.....	Houston.....	Chickasaw.....	Mississippi.
D. B. White.....	Snow Creek.....	Iredell.....	North Carolina.
J. H. Roark.....	Marion.....	Union.....	Louisiana.
M. M. Moulton.....	Webster.....	do.....	Dakota.
A. W. Hawkins.....	Huntingdon.....	Carroll.....	Tennessee.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
John G. Edwards	Edward	Franklin	Ohio.
John Merkle	Reno	Houston	Minnesota.
John Blume	Marathon	Marathon	Wisconsin.
Hon. A. B. Greenwood	Bentonville	Benton	Arkansas.
J. R. Plyler	Plyler's	Lancaster	South Carolina.
G. G. Hughes	Burlington	Boone	Kentucky.
Ell Stewart	Stewart's Mill	Schley	Georgia.
J. S. Durham	Double Shoal	Cleveland	North Carolina.
W. R. Capehart	Avoca	Bertie	Do.
W. H. Cook	Saddlersville	Robertson	Tennessee.
Miss Jane P. Jones	Jones Creek	Anson	North Carolina.
Dr. L. J. Thomas	York	Houston	Georgia.
D. Blenven, jr.	Labadieville	Assumption	Louisiana.
Robt. J. Jewell	Elk Creek	Spencer	Kentucky.
John F. Webster	Rutland	Harrison	Do.
L. A. Lavender	Mantus	Greene	Alabama.
Newel Thurston	Hope	Dickinson	Kansas.
V. M. Howard	Deerfield	Franklin	Massachusetts.
Sarah E. W. Winslow	Science Hill	Bandolph	North Carolina.
Geo. H. Dunn	Greensburgh	Decatur	Indiana.
Dr. W. F. Brooker	Pine Plains	Lexington	South Carolina.
Ben. R. Berry	Brooksville	Blount	Alabama.
Levi T. Branson	White House	Randolph	North Carolina.
E. B. Proctor	Lumberton	Robeson	Do.
W. L. Coleman	Laneburgh	Pickens	Alabama.
W. C. McMurray	Farmer City	De Witt	Illinois.
John F. Holden	Crawfordville	Tallapoosa	Georgia.
Mont Robinson	Fairmont	Vermillion	Louisiana.
Mrs. Isaac Seassums	Seassumsville	Oktibbeha	Mississippi.
Thomas G. Scott	Forsyth	Monroe	Georgia.
James L. Newhouse	Reed's Station	Delaware	Indiana.
H. B. Blakely	Scuffletown	Laurens	South Carolina.
Judge B. P. Harran	Arlington	Reno	Kansas.
W. J. Rice	Liberty	Pickens	South Carolina.
Calvin Hardison	Hardison's Mills	Maury	Tennessee.
J. K. Neal	Neal	Pickett	Do.
George L. Hays	Marshall	Saline	Missouri.
M. C. Wilcox	Mount Atry	Habersham	Georgia.
A. W. Stokes	Newnan	Coweta	Do.
Jas. B. Hunnicutt	Turin	Coweta	Do.
W. A. Austin	Gibraltar	Union	North Carolina.
J. Hunsucker	Conover	Catawba	Do.
William Miller	Union	Green	Alabama.
R. L. McNabb	Ooltewah	James	Tennessee.
W. A. Morton	Abilene	Dickinson	Kansas.
D. A. Speer	Varnell's Station	Whitfield	Georgia.
John M. Smith	Skelton	Jefferson	Alabama.
Henry C. Long	Waverly	Clay	Mississippi.
Ira C. Dickerson	Lawley	Shelby	Alabama.
W. P. Bradford	Danburgh	Wilkes	Georgia.
W. P. Stearns	Stearnsville	Pike	Do.
Josiah Buscton	Shaker	Warren	Ohio.
W. B. Johnson	Moore's Creek	Jackson	Kentucky.
J. M. Scott	Montpelier	Clay	Mississippi.
O. B. Jenks	North Brook	Lincoln	North Carolina.
N. L. Willet	Augusta	Richmond	Georgia.
F. D. Parmelee	Hillsdale	Hillsdale	Michigan.
Daniel Faulkner	Poston	Ripley	Indiana.
J. C. Hunter	Goshen Hill	Union	South Carolina.
Dr. V. S. McNider	Jackson	Northampton	North Carolina.
J. M. Myers	Belton	Hall	Georgia.
J. H. Tabor	Bankston	Choctaw	Mississippi.
George W. Turner	Lillington	Harnett	North Carolina.
B. L. Blackmore	Warsaw	Duplin	Do.
Dr. E. C. Cochran	Tunnel Hill	Whitfield	Georgia.
J. R. Widby	Lenoir	Caldwell	North Carolina.
James A. Evans	Scottville	Macoupin	Illinois.
Rev. William E. Kimball	Madison	Madison	Nebraska.
J. P. Atkins	Pittsburg Landing	Hardin	Tennessee.
John R. Gill	Wilson	Winona	Tennessee.
Dr. James P. Owen	Point Peter	Searcy	Arkansas.
H. F. Shaner	Troy	Dominphan	Kansas.
E. B. Sankey	Salem	Dent	Missouri.
J. G. Orton	Binghamton	Broome	New York.
D. W. Brailsford	Panola	Clarendon	North Carolina.
Mary C. Jameson	Geneva	Talbot	Georgia.
W. H. Dunkin	Hutchinson	Reno	Kansas.
W. F. White	Ford's Store	Hart	Georgia.
C. E. Webster	Almond	Portage	Wisconsin.
T. C. Osborn	Cleburne	Johnson	Texas.
Stephen Crosby	Meador	Union	South Carolina.
Daniel Stone	Cincinnati		Ohio.
William H. Hancock	Abbeville	Abbeville	South Carolina.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
H. D. Pearce.....	Runnels.....	Runnels.....	Texas.
W. J. Davison.....	Farmland.....	Randolph.....	Indiana.
A. Hoffman.....	Hartley.....	Montgomery.....	Texas.
H. F. Stringfellow.....	Deep Spring.....	Cheatham.....	Tennessee.
J. H. Wood.....	Cedar Plains.....	Morgan.....	Alabama.
L. D. Walrad.....	Mount Ida.....	Anderson.....	Kansas.
C. Bouseman.....	Saratoga.....	Randolph.....	Indiana.
Helen F. Halloway.....	Winslow.....	Harnett.....	North Carolina.
Thomas Marrow.....	Hartsell.....	Morgan.....	Alabama.
H. J. Raysdale.....	Urena.....	Ranks.....	Georgia.
R. S. McMahon.....	Chachoula.....	Terre Bonne.....	Louisiana.
J. H. Williams.....	Fordland.....	Webster.....	Missouri.
R. B. Olmstead.....	Milan.....	Rock Island.....	Illinois.
Charles P. Hillan.....	Centreville.....	Montgomery.....	Ohio.
David Evans.....	Macedonia.....	Franklin.....	Indiana.
C. B. Baugh.....	Merzhan's Cross R'ds	Laurel.....	Kentucky.
John McCullough.....	Hillsborough.....	Jasper.....	Georgia.
M. E. Stewart.....	Clanton.....	Chilton.....	Alabama.
H. Keneghan.....	Brandon.....	Rankin.....	Mississippi.
J. C. Hutchison.....	Monmouth.....	Warren.....	Illinois.
Sallie Dillon.....	Little Rock.....	Marion.....	South Carolina.
T. J. Maxwell.....	Saint John.....	Stafford.....	Kansas.
H. J. Yarbrough.....	Guernsey.....	Hempstead.....	Arkansas.
S. N. Russell.....	Blairsville.....	York.....	South Carolina.
G. H. Slaughter.....	Saint Bethlehem.....	Montgomery.....	Tennessee.
G. W. Templeton.....	Mooresville.....	Iredell.....	North Carolina.
J. H. Gouger.....	Davidson College.....	Mecklenburgh.....	Do.
William M. Towers.....	Rome.....	Floyd.....	Georgia.
L. M. Wainwright.....	Noblesville.....	Hamilton.....	Indiana.
I. N. Beckner.....	Whitesburgh.....	Hamblem.....	Tennessee.
R. S. Allen.....	Tyra.....	Moore.....	North Carolina.
W. C. Rollins.....	Rome.....	Williamsburgh.....	South Carolina.
Hosea Hale.....	Love's Level.....	Union.....	North Carolina.
George Allen.....	Poland.....	Mahoning.....	Ohio.
Ira A. Fitzgerald.....	Linwood.....	Davidson.....	North Carolina.
William A. Black.....	Americus.....	Sumpter.....	Georgia.
N. L. Willet.....	Augusta.....	Richmond.....	Do.
A. E. Sprague.....	Bree.....	Franklin.....	Ohio.
M. L. Lamaster.....	Pinkney.....	Union.....	South Carolina.
William Wine.....	Rockford.....	Blount.....	Tennessee.
H. B. Garrett.....	Daleville.....	Delaware.....	Indiana.
Dr. A. Austin.....	Gibralter.....	Union.....	North Carolina.
Dr. P. D. Robertson.....	Lima.....	Carroll.....	Missouri.
W. L. Belk.....	Big Springs.....	Clay.....	Mississippi.
W. J. Dennis.....	Indiantown.....	Williamsburgh.....	South Carolina.
J. A. Hartzler.....	Mottville.....	Saint Joseph.....	Michigan.
R. Tusner.....	Wellford.....	Spartanburgh.....	South Carolina.
J. B. Alexander.....	Duck Creek.....	Dallas.....	Texas.
John L. Bardin.....	Effingham Station.....	Marian.....	South Carolina.
John A. R. Kilpatrick.....	Navasota.....	Grimes.....	Texas.
Peter Hulling.....	Parker.....	Montgomery.....	Kansas.
W. L. Gilbert.....	Elmwood.....	Iredell.....	North Carolina.
J. B. Anderson.....	Waterloo.....	Laurens.....	South Carolina.
Ed. Zumbro.....	Browning.....	Linn.....	Missouri.
A. W. Wilcox.....	Le Mars.....	Plymouth.....	Iowa.
William H. Bonner.....	Calhoun.....	Gordon.....	Georgia.
J. W. Clopton.....	Lamar.....	Sumter.....	Do.
J. T. Thompson.....	Lilly Pond.....	Gordon.....	Do.
E. J. Simmons.....	Courtland.....	Lawrence.....	Alabama.
G. F. Arnick.....	Scipio.....	Jennings.....	Indiana.
James M. Johnson.....	Hoover Hill.....	Randolph.....	North Carolina.
C. C. White.....	High Point.....	Guilford.....	Do.
John G. Kay.....	Ithaca.....	Darke.....	Ohio.
F. A. O. Angle.....	Dandridge.....	Jefferson.....	Tennessee.
John Christine.....	Waymansville.....	Bartholomew.....	Indiana.
Prof. J. Allen Holt.....	Oak Ridge.....	Guilford.....	North Carolina.
S. P. Hardy.....	Markleville.....	Madison.....	Indiana.
Samuel Pruitt.....	Polk Bayou.....	Sharp.....	Arkansas.
D. H. Bagley.....	Beulah.....	Johnston.....	North Carolina.
H. P. Davis.....	Fairfield.....	Freestone.....	Texas.
H. C. Hogg.....	Boonville.....	Owsly.....	Kentucky.
J. N. Mangum.....	Pine Tree.....	Chesterfield.....	South Carolina.
J. W. Renfro.....	Howth Station.....	Waller.....	Texas.
P. Bryan, Jr.....	Leesdale.....	Morgan.....	Alabama.
J. M. Hough.....	Old Store.....	Chesterfield.....	South Carolina.
Henry Baxter.....	Galen.....	Warren.....	Pennsylvania.
N. J. Proctor.....	O'Kean.....	Randolph.....	Arkansas.
G. W. Brooks.....	Ellsworth.....	Mahoning.....	Ohio.
T. Collins.....	Choctoc.....	Union.....	Georgia.
Thomas L. Reid.....	Robertson.....	Clay.....	Mississippi.
J. S. Britt.....	Wideman's.....	Abbeville.....	South Carolina.
Dr. George C. McNeill.....	Catawba.....	Catawba.....	North Carolina.
Warren F. Woodliff.....	Brown's Bridge.....	Forsyth.....	Georgia.

List of tornados reported, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
David Burris.....	Big Lick.....	Stanley.....	North Carolina.
G. R. Phillips.....	Chickamauga.....	Hamilton.....	Tennessee.
L. A. Elster.....	Jeffersonville.....	Fayette.....	Ohio.
T. C. Sexton.....	Burnt Factory.....	Spartanburg.....	South Carolina.
W. L. Springfield.....	Bellville.....	Austin.....	Texas.
C. I. Holland.....	Holland's Store.....	Chatooga.....	Georgia.
J. A. D. Stephenson.....	Statesville.....	Iredell.....	North Carolina.
Samuel Buchanan.....	Welda.....	Anderson.....	Kansas.
John G. Detwiler.....	New Smyrna.....	Volusia.....	Florida.
W. O. Kidder.....	Youngstown.....	Warren.....	Illinois.
W. C. Dunn.....	Simpson's Mills.....	Laurens.....	South Carolina.
V. M. Lahman.....	Wiota.....	Cass.....	Iowa.
W. M. Stringer.....	Stringer.....	Morgan.....	Alabama.
O. G. Campbell.....	Greenville.....	Washington.....	Texas.
M. B. Clark.....	Haskell.....	Anderson.....	Kansas.
John T. M. Haire.....	Lexington.....	Oglethorpe.....	Georgia.
M. D. Watson.....	Line Creek.....	Webster.....	Mississippi.
H. J. Siarnes.....	Mount Prospect.....	Union.....	North Carolina.
J. W. Hackworth.....	Brenham.....	Washington.....	Texas.
William L. Jones.....	Atlanta.....	Fulton.....	Georgia.
E. R. Steele.....	Neodesha.....	Wilson.....	Kansas.
Morgan Blair.....	Cedar Valley.....	Caldwell.....	North Carolina.
John D. Johnson.....	State Road.....	Surrey.....	Do.
C. H. Longstreth.....	Lakin.....	Finney.....	Kansas.
W. R. Hambrick.....	Leasburg.....	Caswell.....	North Carolina.
T. W. Smith.....	O'Neal's Mills.....	Troup.....	Georgia.
George F. Houser.....	Ellinwood.....	Barton.....	Kansas.
G. A. Kelley, M. D.....	Burns.....	Marion.....	Do.
W. H. Knight.....	Kimeo.....	Washington.....	Do.
E. W. Russey.....	Bowie.....	Montague.....	Texas.
Eugene Honerton.....	Solomon City.....	Dickinson.....	Kansas.
J. F. Boyd.....	Personville.....	Limestone.....	Texas.
J. J. Jones.....	Milton.....	Caswell.....	North Carolina.
W. W. McCracken.....	Beloit.....	Mitchell.....	Kansas.
N. B. Snapp.....	Winslow.....	De Kalb.....	Missouri.
Mrs. J. N. Holland.....	Anderson.....	Webster.....	Mississippi.
W. W. Abercrombie.....	Saltville.....	Mitchell.....	Kansas.
Samuel Huffman.....	Matanzas.....	Chautauqua.....	Do.
J. A. Corpening.....	Mill River.....	Henderson.....	North Carolina.
L. E. Vermillion.....	Prosper.....	Rice.....	Kansas.
J. T. Steward.....	Steward's Mill.....	Freestone.....	Texas.
W. N. Hall.....	Smith Centre.....	Smith.....	Kansas.
E. B. Johnson.....	Chapel Hill.....	Washington.....	Texas.
W. H. Wilcox.....	Wilcox.....	Trego.....	Kansas.
W. P. Davis.....	Sunny Side.....	Waller.....	Texas.
Thomas Bradford.....	Centre.....	Cherokee.....	Alabama.
J. E. Thompson.....	Mount Hersey.....	Newton.....	Arkansas.
Charles A. Wyman.....	Hutchinson.....	McLeod.....	Minnesota.
E. E. Middleton.....	Woolstock.....	Wright.....	Iowa.
J. A. Fawkes.....	Delphi.....	Alleghany.....	North Carolina.
W. E. Logan.....	Grantville.....	Buncombe.....	Do.
Mrs. E. J. Bennett.....	Cashiers.....	Jackson.....	Do.
C. J. Trafton.....	Haymond.....	Presidio.....	Texas.
J. C. G. Smith.....	Fredonia.....	Wilson.....	Kansas.
J. W. Seaman.....	Loveland.....	Larimer.....	Colorado.
W. B. Pearson.....	Gere.....	Barton.....	Kansas.
George Wright.....	Dighton.....	Lane.....	Do.
Nathan Potter.....	Paris.....	Lincoln.....	Do.
Eli Newsom.....	Spring Valley.....	Mitchell.....	Texas.
A. L. Hannaford.....	Lehigh.....	Marion.....	Kansas.
Julia Emmons.....	Cutts.....	Lane.....	Do.
J. E. Shaw.....	Mulvane.....	Sumner.....	Do.
Frank B. Hancock.....	Casky.....	Christian.....	Kentucky.
Ed Atkin.....	Freemont.....	Graham.....	Kansas.
O. W. Crampton.....	Osborne.....	Osborne.....	Do.
F. W. Hopkins.....	Greenbrier.....	Limestone.....	Alabama.
O. W. McReynolds.....	Nepesta.....	Pueblo.....	Colorado.
R. R. Wilkinson.....	Weston.....	Dunn.....	Wisconsin.
Henry Horu.....	Marshall.....	Searcy.....	Arkansas.
J. J. Larrise.....	Mecklenburgh.....	Schuyler.....	New York.
J. K. Wise.....	Blairstown.....	Benton.....	Iowa.
J. A. Keeler.....	Eagle Rapids.....	Smith.....	Kansas.
Richard Owen.....	New Harmony.....	Poey.....	Indiana.
E. L. Dunham.....	Greeley.....	Weld.....	Colorado.
Fred W. Wayner.....	Germantown.....	Smith.....	Kansas.
J. M. Fowler.....	Cashville.....	Spartanburg.....	South Carolina.
George W. Smith.....	Bennet.....	Arappahoe.....	Colorado.
Thomas Davies.....	Abilene.....	Taylor.....	Texas.
J. P. Marshall.....	Black Hawk.....	Carroll.....	Mississippi.
Gustav Bastian.....	Welcome.....	Austin.....	Texas.
A. M. Mulford.....	New Providence.....	Hardin.....	Iowa.
P. M. Ford.....	Cross Plains.....	Robertson.....	Tennessee.
L. M. Bragg.....	Courtney.....	Grimes.....	Texas.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
William R. Allen.....	Jackson.....	Pueblo.....	Colorado.
Frank Bascom.....	Upland.....	Jewell.....	Kansas.
A. H. Morris.....	Rush Centre.....	Rush.....	Do.
E. N. Gilbert.....	Steele City.....	Jefferson.....	Nebraska.
C. D. Wheelock.....	Allison.....	Deontur.....	Kansas.
W. G. Sidwell.....	Hutton.....	Rush.....	Do.
D. B. Painter.....	Hutton.....	Rhea.....	Tennessee.
J. G. Henslee.....	McEwen.....	Humphreys.....	Do.
Pinckney Hawkins.....	Anderson.....	Grimes.....	Texas.
George W. DeLong.....	Saxon.....	Saline.....	Nebraska.
John Stibal.....	Richland.....	Colfax.....	Do.
J. W. Kyle.....	Collyer.....	Trego.....	Kansas.
W. S. Dilworth.....	Cra Orchard.....	Johnson.....	Nebraska.
Ed. F. Brown.....	La Crosee.....	Rush.....	Kansas.
J. S. Bowlby.....	Cañon City.....	Fremont.....	Colorado.
L. F. Davis.....	Athens.....	Jewell.....	Kansas.
E. B. Gatchell.....	Leona.....	Doniphan.....	Do.
William H. Snyder.....	Tapley.....	Osborne.....	Do.
C. P. Blachly.....	Manhattan.....	Elley.....	Do.
A. L. Sparger.....	Mount Airy.....	Surry.....	North Carolina.
W. J. Mossholder.....	Ocoola.....	Folk.....	Nebraska.
Isaac N. Chinoweth.....	Eighty Eight.....	Barren.....	Kentucky.
E. Whitcomb.....	Friend.....	Saline.....	Nebraska.
Sarah Stuart.....	Wolf Creek.....	Cherokee.....	North Carolina.
Q. C. Sasser.....	Falsin.....	Duplin.....	Do.
Joel Hull.....	Winden.....	Kearney.....	Nebraska.
A. G. Eberhart.....	Andalusia.....	Rock Island.....	Illinois.
Joshua Taylor.....	White Cloud.....	Doniphan.....	Kansas.
R. B. Knock.....	Havana.....	Montgomery.....	Do.
W. H. Timberlake.....	Columbus.....	Cherokee.....	Do.
John G. Holston.....	Soldier.....	Jackson.....	Do.
Almon Stuart.....	Zyba.....	Kearney.....	Nebraska.
George Shedd.....	Ashland.....	Sanders.....	Do.
W. E. W. Bailey.....	Lapland.....	Greenwood.....	Kansas.
John L. Mitch.....	Catlin.....	Bent.....	Colorado.
S. G. Graham.....	Catlin.....	do.....	Do.
Isham Cox.....	Liberty.....	Randolph.....	North Carolina.
Agnes Kinnear.....	Standardt.....	Iowa.....	Wisconsin.
E. R. Ewell.....	Bird Nest.....	Pawnee.....	Kansas.
E. N. Eubanks.....	Hawthorne.....	Aiken.....	South Carolina.
G. W. Norman.....	Apishapa.....	Los Animas.....	Colorado.
V. S. Runnels.....	Runelsburg.....	Hall.....	Nebraska.
A. Knievel.....	Clearwater.....	Antelope.....	Do.
John James.....	James Crossing.....	Jackson.....	Kansas.
V. Van Trump.....	Belleville.....	Republic.....	Do.
E. B. McNitt.....	Red Cloud.....	Webster.....	Nebraska.
R. Phillips.....	La Junta.....	Bent.....	Colorado.
Ira N. Lyman.....	Saint Peter.....	Cedar.....	Nebraska.
Charles Ruff.....	Hodgeman.....	Hodgeman.....	Kansas.
J. H. Milhouse.....	Jewell.....	Dawson.....	Nebraska.
C. Fountain.....	Millbrook.....	Graham.....	Kansas.
W. D. Cox.....	Ulysses.....	Butler.....	Nebraska.
Edward Trow.....	Minneapolis.....	Ottawa.....	Kansas.
E. J. Brethowder.....	Holland.....	Lancaster.....	Nebraska.
Ed. Gilford.....	Cowles.....	Webster.....	Do.
E. A. Sayre.....	Himrod's.....	Yates.....	New York.
Samuel E. Hardy.....	East Norway.....	Doniphan.....	Kansas.
C. P. Woodworth.....	Lodi.....	Seneca.....	New York.
C. H. Heald.....	Mill Creek.....	Chichasaw Natonl.....	Indian Territory.
John C. Mallory.....	Savona.....	Steuben.....	New York.
A. V. Butterfield.....	Eleven Mile.....	Potter.....	Pennsylvania.
E. R. Rogers.....	Corning.....	Steuben.....	New York.
J. M. McClain.....	Catlin.....	Bent.....	Colorado.
John Shoff.....	Grafton.....	Fillmore.....	Nebraska.
E. D. Burgess.....	Breesport.....	Chemung.....	New York.
B. F. Reagan.....	Raymond.....	Lancaster.....	Nebraska.
A. D. Swallow.....	Sterling.....	Johnson.....	Do.
William T. Lewis.....	Louisville.....	Winston.....	Mississippi.
Eddie Lewis.....	Worthing.....	Lincoln.....	Dakota.
T. N. Hartzell.....	Kearney.....	Buffalo.....	Nebraska.
Isaac E. Heaton.....	Fremont.....	Dodge.....	Do.
Solomon Cain.....	Wilcox.....	Nodaway.....	Missouri.
A. M. Pierce.....	Byrdstown.....	Pickett.....	Tennessee.
Harrison Russell.....	Dig Creek.....	Steuben.....	New York.
C. H. Sharpe.....	Friendship.....	Alleghany.....	Do.
W. T. Chapman.....	Ponca.....	Dixon.....	Nebraska.
E. F. Hutchinson.....	Bellwood.....	Bulter.....	Do.
Thomas A. Sawyer.....	Campbell.....	Steuben.....	New York.
Samuel D. I. Emerson.....	Milford.....	Seward.....	Nebraska.
G. W. Swick.....	Rocky Ford.....	Bent.....	Colorado.
G. H. Ransom.....	Baneroft.....	Cuming.....	Nebraska.
R. McHutcheon.....	White Rock.....	Republic.....	Kansas.
C. F. Purdy.....	Purdyville.....	Hodgeman.....	Do.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
N. B. S. Odell.....	Fullerton.....	Nance.....	Nebraska.
A. C. Folsom.....	Dell Rapids.....	Minnehaha.....	Dakota.
C. D. Harris.....	Ovid.....	Seneca.....	New York.
Almedia L. Young.....	Branchport.....	Yates.....	Do.
S. A. Hebrew.....	Rockport.....	Rooks.....	Kansas.
J. Edward Wiley.....	Waverly.....	Morgan.....	Indiana.
G. S. Bishop.....	Indianola.....	Red willow.....	Nebraska.
Peter Halspair.....	Swaburg.....	Dodge.....	Do.
Charles Shieldstream.....	Central City.....	Merrick.....	Do.
P. F. Peterson.....	Tekamah.....	Burt.....	Do.
Sarah D. Anderman.....	Creston.....	Platte.....	Do.
Clyde C. Way.....	Kendall Creek.....	McKean.....	Pennsylvania.
J. Farwell.....	Phillips Creek.....	Alleghany.....	New York.
Etta Francis.....	Runnymede.....	Harper.....	Kansas.
A. Scheuber.....	Erfurt.....	Jefferson.....	Wisconsin.
P. S. Howell.....	Brett.....	Norton.....	Kansas.
D. L. Tallmadge.....	Cambridge.....	Furnas.....	Nebraska.
P. A. Bryant.....	Sonora.....	Steuben.....	New York.
S. Bredelman.....	Doniphan.....	Hall.....	Nebraska.
J. B. Nugent.....	Sherwood.....	Calumet.....	Do.
A. Morell.....	Oakland.....	Burt.....	Do.
E. P. Barber.....	Syracuse.....	Hamilton.....	Kansas.
Abner C. Wright.....	Wellsburg.....	Chemung.....	New York.
W. J. Crane.....	Arlington.....	Washington.....	Nebraska.
George D. Carrington.....	Brownsville.....	Nemaha.....	Do.
A. J. Barnes.....	Millport.....	Potter.....	Pennsylvania.
R. D. Winn.....	Lawrenceville.....	Gwinnet.....	Georgia.
H. Mower, M. D.....	Saint Marys.....	Pottawottamie.....	Kansas.
C. F. Carr.....	Clarence.....	Barton.....	Do.
N. T. Moulton.....	Cedar Rapids.....	Boone.....	Nebraska.
George C. Silsbee.....	Avoca.....	Steuben.....	New York.
Lott Reynor.....	Arkport.....	do.....	Do.
J. B. Lewis.....	Thornton.....	Polk.....	Nebraska.
James E. Blair.....	Elkpoint.....	Union.....	Dakota.
E. Bartholomew.....	Rockport.....	Rooks.....	Kansas.
Thomas D. McCague.....	Garnet.....	Anderson.....	Do.
C. H. Goddard.....	Swan Lake.....	Turner.....	Dakota.
L. Case.....	Knoxville.....	Tioga.....	Pennsylvania.
D. E. James.....	Richland Centre.....	Richland.....	Wisconsin.
Michael Griffin.....	Springfield.....	Bon Homme.....	Dakota.
M. A. Butterfield.....	Montrose.....	McCook.....	Do.
J. W. McReynolds.....	Tower Spring.....	Lincoln.....	Kansas.
Andrew Johnson, Jr.....	Bega.....	Stanton.....	Nebraska.
D. R. Callahan, Jr.....	Stockville.....	Frontier.....	Do.
W. H. Hubbard.....	Fairview.....	Lincoln.....	Dakota.
E. Bisbee.....	West Branch.....	Potter.....	Pennsylvania.
E. G. Bruner.....	West Point.....	Cuming.....	Nebraska.
John L. Hunt.....	Villanow.....	Walker.....	Georgia.
C. Q. De France.....	Kesterson.....	Jefferson.....	Nebraska.
James B. Wright.....	Zenith.....	Reno.....	Kansas.
Thomas G. Hull.....	Brookland.....	Potter.....	Pennsylvania.
Max Monvoison.....	Max.....	Dundy.....	Nebraska.
C. P. Wetzell.....	Stockville.....	Frontier.....	Do.
Nathan Campbell.....	Kearney.....	Buffalo.....	Do.
C. J. Fox.....	La Grange.....	Yankton.....	Dakota.
E. Miller.....	Lawrence.....	Douglas.....	Kansas.
Artemus Walters.....	Ula.....	Custer.....	Colorado.
M. Ryan.....	Jefferson.....	Union.....	Dakota.
Peter Ring.....	Big Spring.....	do.....	Do.
Henj. C. Rich.....	Ellis.....	Ellis.....	Kansas.
A. C. Tyrrell.....	Madison.....	Madison.....	Nebraska.
E. D. Parsons.....	Indian Creek.....	York.....	Do.
F. D. Hulbert, M. D.....	Loganville.....	Sauk.....	Wisconsin.
I. B. Wiley.....	Wileysville.....	Steuben.....	New York.
A. G. Garrett.....	Ward.....	Overton.....	Tennessee.
R. S. Gaylord.....	Riverside.....	Clay.....	Dakota.
Mrs. M. E. Ellis.....	Gothland.....	Union.....	Do.
Thomas Maher.....	Emmett.....	do.....	Do.
Will M. Cravin.....	Armada.....	Buffalo.....	Nebraska.
Erastus Smith.....	Beaver Creek.....	do.....	Do.
Frank S. Gay.....	Red Wing.....	Nance.....	Do.
T. O. Tucker.....	Saint Francis.....	Clay.....	Arkansas.
C. W. Gray.....	Jordan Springs.....	Reno.....	Kansas.
Elizabeth Tugals.....	Long Creek.....	Lincoln.....	Dakota.
W. O. Da.....	Eagle.....	Cass.....	Nebraska.
Will.....	133 E. Sixteenth street New York City.....	New York.....	New York.
	Martin.....	Alleghan.....	Michigan.
	Cloverland.....	Clay.....	Indiana.
	Wayne.....	Wayne.....	Nebraska.
	Nelson.....	Vigo.....	Indiana.
	Ashborough.....	Clay.....	Do.
	Flandreau.....	Moody.....	Dakota.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
O. R. Gaskill.....	White Oak.....	Mahaska.....	Iowa.
Miss Ara C. G. Williams.....	Rescue.....	Saunders.....	Nebraska.
W. W. Craddock.....	Knoxville.....	Marion.....	Iowa.
L. S. Rouse.....	Belle Plain.....	Shawano.....	Wisconsin.
E. Roberts.....	Hall's Summit.....	Coffey.....	Kansas.
H. L. Williams.....	Lineburg.....	Pickens.....	Alabama.
J. E. Shultz.....	Arberville.....	York.....	Nebraska.
I. F. Cox.....	La Grange.....	Troup.....	Georgia.
J. E. W. Haile.....	Flat Rock.....	Kershaw.....	South Carolina.
Thos Owen.....	Owenville.....	Sampson.....	North Carolina.
Jane Harris.....	do.....	do.....	Do.
Marx F. Wistrom.....	Harvard.....	Clay.....	Nebraska.
George A. Teel.....	Seaton.....	Hamilton.....	Do.
G. M. Dodge.....	Glencoe.....	Dodge.....	Do.
Albert Ames.....	Kendall.....	Van Buren.....	Michigan.
Timothy Church.....	Cheshire.....	Allegan.....	Do.
R. Lamkins.....	Dodge.....	Trempealeau.....	Wisconsin.
D. C. Godfrey.....	Plato.....	Saline.....	Nebraska.
D. M. Camp.....	Ben Wade.....	Pawnee.....	Kansas.
W. E. Curtis.....	Brown's Grove.....	do.....	Do.
E. Royce.....	Palisade.....	Minnehaha.....	Dakota.
H. D. Stockman.....	Woodville.....	Saint Croix.....	Wisconsin.
F. N. Robinson.....	Howard.....	Miner.....	Dakota.
Reuben F. Little.....	Richardson.....	Polk.....	Wisconsin.
I. H. Ross.....	Leeds.....	Jefferson.....	Alabama.
Julius Peterson.....	Rice Lake.....	Barron.....	Wisconsin.
E. G. Buttz.....	Stillwater.....	Washington.....	Minnesota.
Joseph Streiff.....	Oakdale.....	do.....	Do.
W. H. Wood.....	Brookville.....	Saint Croix.....	Wisconsin.
C. J. White.....	New Centerville.....	do.....	Do.
Mrs. J. Klingensmith.....	Orangeville Mills.....	Barry.....	Michigan.
Craig W. Green.....	Elmira.....	Chemung.....	New York.
J. Q. Mahaffey.....	Lickville.....	Greenville.....	South Carolina.
S. P. Chase.....	Brookfield.....	Tioga.....	Pennsylvania.
A. J. Owen.....	Fall Brook.....	do.....	Do.
Stephen Rowellife.....	Oceola Mills.....	Polk.....	Wisconsin.
H. P. Gatchell.....	Asheville.....	Buncombe.....	North Carolina.
D. A. Robertson.....	Saint Paul.....	Ramey.....	Minnesota.
Merrick Kendall.....	Kendall Station.....	Chemung.....	New York.
J. W. Van Vleet.....	Wilson.....	Saint Croix.....	Wisconsin.
Mrs. J. B. Edsall.....	Altus.....	Bradford.....	Pennsylvania.
George Healy.....	Rochester.....	Olmstead.....	Minnesota.
Charles S. Barney.....	West Union.....	Steuben.....	New York.
S. F. Riggs.....	Granville Summit.....	Bradford.....	Pennsylvania.
John Skakron.....	Darlington.....	Darlington.....	South Carolina.
L. C. Floyd.....	Alvin.....	Hamilton.....	Nebraska.
Samuel H. Fry.....	Aurora.....	do.....	Do.
D. K. Marsh.....	Marshfield.....	Tioga.....	Pennsylvania.
Alfred S. Brown.....	Wellsville.....	Alleghany.....	New York.
G. E. Culver.....	Vermillion.....	Clay.....	Dakota.
F. A. Carlson.....	Apple River.....	Polk.....	Wisconsin.
William K. King.....	Ceres.....	Alleghany.....	New York.
A. T. James.....	Blossburgh.....	Tioga.....	Pennsylvania.
D. P. Haight.....	Mountain Lake.....	Bradford.....	Do.
Gustave A. Grant.....	Highland.....	Minnehaha.....	Dakota.
J. N. Sheldon.....	Seio.....	Alleghany.....	New York.
George H. Webb.....	Alba.....	Bradford.....	Pennsylvania.
Hiram O. Chapin.....	White's Corners.....	Potter.....	Do.
W. T. Daly.....	Leona.....	Bradford.....	Do.
W. H. Hudson.....	Larabee.....	McKean.....	Do.
George P. Anderson.....	Bunyan.....	Polk.....	Wisconsin.
George Richardson.....	Bloomington.....	Clay.....	Dakota.
P. I. Burlingame.....	Van Ettenville.....	Chemung.....	New York.
P. A. Greelev.....	Stinson.....	Outagamie.....	Wisconsin.
William J. Raysdill.....	Saint Charles.....	Butler.....	Ohio.
F. H. Rasmussen.....	El Salem.....	Polk.....	Wisconsin.
W. S. Foster.....	Ladora.....	Iowa.....	Iowa.
Harris Taylor.....	Bazette.....	Navarro.....	Texas.
George G. McWhorter.....	Milton.....	Santa Rosa.....	Florida.
J. W. Mulliken.....	Dudley.....	Fillmore.....	Nebraska.
W. L. Harvey.....	Clifton.....	Lackawanna.....	Pennsylvania.
B. M. Hall.....	South Eaton.....	Wyoming.....	Do.
George W. Cooke.....	Beaumont.....	do.....	Do.
E. J. Drum.....	Gouldsborough.....	Lackawanna.....	Do.
S. B. Hills.....	Green Grove.....	do.....	Do.
E. A. Stevens.....	Hollisterville.....	Wayne.....	Do.
Edward Himrod.....	Dunmore.....	Lackawanna.....	Do.
Thomas Johnston.....	Milwaukee.....	do.....	Do.
R. A. Whiteman.....	Lehman.....	Luzerne.....	Do.
Perry A. Clark.....	Cherry Ridge.....	Wayne.....	Do.
John Bryant.....	Elk City.....	Douglas.....	Nebraska.
F. B. Hodge.....	Wilkes-Barre.....	Luzerne.....	Pennsylvania.
T. B. Orchard.....	Hamilton.....	Wayne.....	Do.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
N. B. S. Odell	Fullerton	Nance	Nebraska.
A. C. Folsom	Dell Rapids	Minnehaha	Dakota.
C. D. Harris	Ovid	Seneca	New York.
Almedia L. Young	Branchport	Yates	Do.
S. A. Hebrew	Rockport	Rooks	Kansas.
J. Edward Wiley	Waverly	Morgan	Indiana.
G. S. Bishop	Indianola	Red willow	Nebraska.
Peter Salspair	Swaburg	Dodge	Do.
Charles Shieldstream	Central City	Merrick	Do.
P. F. Peterson	Tekamah	Burt	Do.
Sarah D. Anderman	Creston	Platte	Do.
Clyde C. Way	Kendall Creek	McKean	Pennsylvania.
J. Farwell	Phillips Creek	Allegany	New York.
Etta Francis	Runnymede	Harper	Kansas.
A. Scheuber	Erfurt	Jefferson	Wisconsin.
P. S. Howell	Brett	Norton	Kansas.
D. L. Tallmadge	Cambridge	Furnas	Nebraska.
P. Bryant	Sonora	Steuben	New York.
M. Bredelman	Doniphan	Hall	Nebraska.
J. B. Nugent	Shawwood	Calumet	Do.
A. Morell	Oakland	Burt	Do.
E. P. Barber	Syracuse	Hamilton	Kansas.
Abner C. Wright	Wellsburg	Chemung	New York.
W. J. Crano	Arlington	Washington	Nebraska.
George T. Carrington	Brownsville	Nemaha	Do.
A. J. Barnes	Millport	Potter	Pennsylvania.
R. D. Winn	Lawrenceville	Gwinnet	Georgia.
H. Mower, M. D.	Saint Marys	Pottawottamie	Kansas.
C. F. Carr	Clarence	Barton	Do.
N. T. Moulton	Cedar Rapids	Boone	Nebraska.
George C. Silsbee	Avoca	Steuben	New York.
Lott Reynor	Arkport	do	Do.
J. B. Lewis	Thornton	Polk	Nebraska.
James E. Blair	Elkpoint	Union	Dakota.
E. Bartholomew	Rockport	Rooks	Kansas.
Thomas D. McCague	Garnet	Anderson	Do.
C. H. Goddard	Swan Lake	Turner	Dakota.
L. Case	Knoxville	Tioga	Pennsylvania.
D. E. James	Richland Centre	Richland	Wisconsin.
Michael Griffin	Springfield	Bon Homme	Dakota.
M. A. Butterfield	Montrose	McCook	Do.
J. W. McReynolds	Tower Spring	Lincoln	Kansas.
Andrew Johnson, Jr	Bega	Stanton	Nebraska.
D. R. Callahan	Stockville	Frontier	Do.
W. H. Hubbard	Fairview	Lincoln	Dakota.
E. Blabee	West Branch	Potter	Pennsylvania.
E. G. Bruner	West Point	Cuming	Nebraska.
John L. Hunt	Villanow	Walker	Georgia.
C. Q. De France	Kesterson	Jefferson	Nebraska.
James B. Wright	Zenith	Reno	Kansas.
Thomas G. Hull	Brookland	Potter	Pennsylvania.
Max Monvoison	Max	Dundy	Nebraska.
C. P. Wetzell	Stockville	Frontier	Do.
Nathan Campbell	Kearney	Buffalo	Do.
C. J. Fox	La Grange	Yankton	Dakota.
E. Miller	Lawrence	Douglas	Kansas.
Artemus Walters	Ula	Custer	Colorado.
M. Ryan	Jefferson	Union	Dakota.
Peter Ring	Big Spring	do	Do.
Benj. C. Rich	Ellis	Ellis	Kansas.
A. C. Tyrrell	Madison	Madison	Nebraska.
E. D. Parsons	Indian Creek	York	Do.
F. D. Hulbert, M. D.	Loganville	Sauk	Wisconsin.
I. B. Wiley	Wileysville	Steuben	New York.
A. G. Garrett	Ward	Overton	Tennessee.
R. S. Gaylord	Riverside	Clay	Dakota.
Mrs. M. E. Ellis	Gothland	Union	Do.
Thomas Maher	Emmett	do	Do.
Will M. Cravin	Armada	Buffalo	Nebraska.
Erastus Smith	Beaver Creek	do	Do.
Frank S. Gay	Red Wing	Nance	Do.
T. O. Tucker	Saint Francis	Clay	Arkansas.
C. W. Gray	Jordan Springs	Reno	Kansas.
Elizabeth Ingalls	Long Creek	Lincoln	Dakota.
W. G. Daugherty	Eagle	Cass	Nebraska.
William A. Eddy	133 E. Sixteenth street New York City.	New York	New York.
G. B. Nichols	Martin	Allegan	Michigan.
G. W. Moore	Cloverland	Clay	Indiana.
Frank Fuller	Wayne	Wayne	Nebraska.
Josiah Cusick	Nelson	Vigo	Indiana.
John W. McGinnis	Ashborough	Clay	Do.
M. M. Jones	Flandreau	Moody	Dakota.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
O. R. Gaskill.....	White Oak.....	Mahaska.....	Iowa.
Miss Ara C. G. Williams.....	Rescue.....	Saunders.....	Nebraska.
W. W. Craddock.....	Knoxville.....	Marion.....	Iowa.
L. S. Rouse.....	Belle Plain.....	Shawano.....	Wisconsin.
E. Roberts.....	Hall's Summit.....	Coffey.....	Kansas.
H. L. Williams.....	Lineburg.....	Pickens.....	Alabama.
J. E. Shultz.....	Arberville.....	York.....	Nebraska.
I. F. Cox.....	La Grange.....	Troup.....	Georgia.
J. E. W. Halle.....	Flat Rock.....	Kernshaw.....	South Carolina.
Thos. Owen.....	Owenville.....	Sampson.....	North Carolina.
Jane Harris.....	do.....	do.....	Do.
Marx F. Wistrom.....	Harvard.....	Clay.....	Nebraska.
George A. Teel.....	Seaton.....	Hamilton.....	Do.
O. M. Dodge.....	Glencoe.....	Dodge.....	Do.
Albert Armes.....	Kendall.....	Van Buren.....	Michigan.
Timothy Church.....	Cheshire.....	Allegan.....	Do.
R. Lamkins.....	Dodge.....	Trempealeau.....	Wisconsin.
D. C. Godfrey.....	Plato.....	Saline.....	Nebraska.
D. M. Camp.....	Ben Wade.....	Pawnee.....	Kansas.
W. E. Curtis.....	Brown's Grove.....	do.....	Do.
E. Royce.....	Palisade.....	Minnehaha.....	Dakota.
H. D. Stockman.....	Woodville.....	Saint Croix.....	Wisconsin.
F. N. Robinson.....	Howard.....	Miner.....	Dakota.
Reuben F. Little.....	Richardson.....	Polk.....	Wisconsin.
I. H. Ross.....	Leeds.....	Jefferson.....	Alabama.
Julius Peterson.....	Rice Lake.....	Barron.....	Wisconsin.
E. G. Butts.....	Stillwater.....	Washington.....	Minnesota.
Joseph Streiff.....	Oakdale.....	do.....	Do.
W. H. Wood.....	Brookville.....	Saint Croix.....	Wisconsin.
C. J. White.....	New Centreville.....	do.....	Do.
Mrs. J. Klingensmith.....	Orangeville Mills.....	Barry.....	Michigan.
Craig W. Green.....	Elmira.....	Chemung.....	New York.
J. Q. Mahaffey.....	Lickville.....	Greenville.....	South Carolina.
S. P. Chase.....	Brookfield.....	Tioga.....	Pennsylvania.
A. J. Owen.....	Fall Brook.....	do.....	Do.
Stephen Rowellife.....	Osceola Mills.....	Polk.....	Wisconsin.
H. P. Gatchell.....	Asheville.....	Buncombe.....	North Carolina.
D. A. Robertson.....	Saint Paul.....	Ramsey.....	Minnesota.
Merrick Kendall.....	Kendall Station.....	Chemung.....	New York.
J. W. Van Vleet.....	Wilson.....	Saint Croix.....	Wisconsin.
Mrs. J. B. Edsall.....	Altus.....	Bradford.....	Pennsylvania.
George Healy.....	Rochester.....	Olmstead.....	Minnesota.
Charles S. Barney.....	West Union.....	Steuben.....	New York.
S. F. Riggs.....	Granville Summit.....	Bradford.....	Pennsylvania.
John Siskron.....	Darlington.....	Darlington.....	South Carolina.
L. C. Floyd.....	Alvin.....	Hamilton.....	Nebraska.
Samuel H. Fry.....	Aurora.....	do.....	Do.
D. K. Marsh.....	Marshfield.....	Tioga.....	Pennsylvania.
Alfred S. Brown.....	Wellsville.....	Allegany.....	New York.
G. E. Culver.....	Vermillion.....	Clay.....	Dakota.
F. A. Carlson.....	Apple River.....	Polk.....	Wisconsin.
William K. King.....	Ceres.....	Allegany.....	New York.
A. T. James.....	Blossburgh.....	Tioga.....	Pennsylvania.
D. P. Haight.....	Mountain Lake.....	Bradford.....	Do.
Gustave A. Grant.....	Highland.....	Minnehaha.....	Dakota.
J. N. Sheldon.....	Scio.....	Allegany.....	New York.
George H. Webb.....	Alba.....	Bradford.....	Pennsylvania.
Hiram O. Chapin.....	White's Corners.....	Potter.....	Do.
W. T. Daly.....	Leona.....	Bradford.....	Do.
W. H. Hudson.....	Larabee.....	McKean.....	Do.
George P. Anderson.....	Bunyan.....	Polk.....	Wisconsin.
George Richardson.....	Bloomington.....	Clay.....	Dakota.
P. L. Burlingame.....	Van Ettenville.....	Chemung.....	New York.
P. A. Greeley.....	Stinson.....	Outagamie.....	Wisconsin.
William J. Raysdill.....	Saint Charles.....	Butler.....	Ohio.
F. H. Rasmussen.....	El Salem.....	Polk.....	Wisconsin.
W. S. Foster.....	Ladora.....	Iowa.....	Iowa.
Harris Taylor.....	Bazette.....	Navarro.....	Texas.
George G. McWhorter.....	Milton.....	Santa Rosa.....	Florida.
J. W. Mulliken.....	Dudley.....	Fillmore.....	Nebraska.
W. L. Harvey.....	Clifton.....	Lackawanna.....	Pennsylvania.
B. M. Hall.....	South Eaton.....	Wyoming.....	Do.
George W. Cooke.....	Beaumont.....	do.....	Do.
E. J. Drum.....	Gouldsborough.....	Lackawanna.....	Do.
S. B. Hills.....	Green Grove.....	do.....	Do.
E. A. Stevens.....	Hollisterville.....	Wayne.....	Do.
Edward Himrod.....	Dunmore.....	Lackawanna.....	Do.
Thomas Johnston.....	Milwaukee.....	do.....	Do.
R. A. Whiteman.....	Lehman.....	Luzerne.....	Do.
Perry A. Clark.....	Cherry Ridge.....	Wayne.....	Do.
John Bryant.....	Elk City.....	Douglas.....	Nebraska.
F. B. Hodge.....	Wilkesbarre.....	Luzerne.....	Pennsylvania.
T. B. Orchard.....	Hamilton.....	Wayne.....	Do.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
W. F. Young	Littleton	Halifax	Pennsylvania.
H. S. Freas	Wapwallopen	Luzerne	Do.
C. S. Fargo	Wanomie	do.	Do.
Charles Ekdohl	Scandia	Washington	Minnesota.
A. C. Sisson	La Plume	Lackawanna	Pennsylvania.
William Thompson	Centremoreland	Wyoming	Do.
Henry Ernst	Bellaasyva	do.	Do.
W. S. Jones	Slocum	Luzerne	Do.
Theodore Day	Dyberry	Wayne	Do.
G. W. Wiedman	Amasa	Lackawanna	Do.
Charles H. Hall	Dallas	Luzerne	Do.
J. F. Wilber	Peckville	Lackawanna	Do.
George A. Silsby	Mitchell	Davidson	Dakota.
A. F. Williams	Goodie	Beadle	Do.
B. J. Cannon	Drinkers	Lackawanna	Pennsylvania.
D. Stewart	Home	Turner	Dakota.
R. M. Dexter	Canova	Miner	Do.
Casper Oberdorfer	Harding	Luzerne	Pennsylvania.
George H. Fassin	Edgard	Saint John Baptist	Louisiana.
C. V. More	Winterdale	Wayne	Pennsylvania.
Albert Martin	Adelia	Turner	Dakota.
S. J. Cornell	De Witt	Sanborn	Do.
Edwin Miller	Grant City	Sac.	Iowa.
James R. Van Buren	Griswoldville	Jones	Georgia.
J. W. A. Wright	Greensborough	Hale	Alabama.
E. Sawyer	Sawyer ville	do.	Do.
Henry A. Taylor	Gallion	do.	Do.
W. E. Moor	Bridgetown	Shelby	Do.
C. P. Luttrell	Pearson	Fayette	Ohio
Dana Rhodes	Groton	Tompkins	New York.
David W. Lester	Haddock Station	Jones	Georgia.
Otis Scovall	New Helena	Custer	Nebraska.
John F. Vardaman	Kellyton	Coosa	Alabama.
E. J. Blackburn	Ironville	Perry	Do.
J. R. Baxter	Lebanon	De Kalb	Do.
L. Grovitt Rhodentown	Rhodentown	do.	Do.
B. C. Willis	Burton's Hill	Greene	Do.
J. S. Hansberger	Tionus	Bibb	Do.
James F. Bailey	Marion	Perry	Do.
A. C. Copeland	Crossville	De Kalb	Georgia.
J. J. Parish	Adell	Berrien	Georgia.
J. J. Lee	Sand Tuck	Ellmore	Alabama.
James M. McCullough	Felix	Perry	Do.
George W. Duncan	Franklin	Simpson	Kentucky.
D. R. Antry	Dismal	Sampson	North Carolina.
G. M. Ellis	Emmetsburgh	Palo Alto	Iowa.
Thomas J. Crumley	Crossville	De Kalb	Alabama.
Alex. Gaddies	Emmetsburgh	Palo Alto	Iowa.
J. A. Yeager	Pondville	Bibb	Alabama.
W. H. Reynolds	Packsville	Clarendon	South Carolina.
H. B. Pruett	Mount Olive	Coosa	Alabama.
J. P. Harris	Harrisburgh	Bibb	Do.
George C. Mosher	1638 Summit street, Kansas City.		Missouri.
W. L. Brown	Van Alstyne	Grayson	Texas.
E. Pasome.	Dallas	Gaston	North Carolina.
Ed. A. Killian	Leavenworth	Leavenworth	Kansas.
B. F. Steedman	Collinsville	Grayson	Texas.
D. Krebs	Kingston	Hunt	Do.
George H. Groves	Melissa	Collins	Do.
W. F. Felty	Hickory Creek	Fannin	Do.
Dan Van Trump	Norborne	Carroll	Missouri.
A. C. Carnes	Weston	Collin	Texas.
T. B. McCracken	Zion	Lowndes	Mississippi.
Simon Daw	Malta Bend	Saline	Missouri.
A. G. Lackey	Marshall	do.	Do.
M. M. Yeakley	Mountain Spring	Cooke	Texas.
A. E. Baum	Bolivar	Denton	Do.
R. M. Orrell	Payetteville	Cumberland	North Carolina.
J. W. Andrews	Laurinburg	Richmond	Do.
G. E. Reeves	Pottshorough	Grayson	Texas.
A. M. Armstrong	Crawford	McLennan	Do.
W. G. Laffender	Sioux Falls	Minnehaha	Dakota.
F. M. Makeig	Waco	McLennan	Texas.
M. Yoakum	Tehuacana	Limestone	Do.
J. I. Adams	Eatonou	Putnam	Georgia.
H. S. Austin	Plevna	Reno	Kansas.
Charles Schaefer	Lorena	McLennan	Texas.
H. F. Fowler	Basin Springs	Grayson	Do.
W. A. Rexroat	Elmont	do.	Do.
L. F. McMillan	Massey's	Hill	Do.
S. Hundley	Cannon	Grayson	Do.
T. C. Carlisle	Itasca	Hill	Do.

List of tornado reporters, June 30, 1885—Continued.

Name.	Post-office.	County.	State or Territory.
Hawley Gerrells.....	Indian Gap.....	Hamilton.....	Texas.
J. M. Kingsley.....	Bosqueville.....	McLennan.....	Do.
John A. Eakins.....	Hico.....	Hamilton.....	Do.
Thomas F. Loader.....	Iredell.....	Bosque.....	Do.
H. C. O'Hara.....	Reno Centre.....	Reno.....	Kansas.
E. L. Drake.....	Kansas Centre.....	Rice.....	Do.
T. S. Hawkins.....	Centre City.....	Hamilton.....	Texas.
L. H. McKee.....	Robinson.....	McLennan.....	Do.
J. C. Wyatt.....	Speegleville.....	do.....	Do.
B. Franklin Abrams.....	277 Broadway, Brook- lyn.....		New York.
George G. Valentine.....	Kingsville.....	Johnson.....	Missouri.
I. D. Graham.....	Manhattan.....	Riley.....	Kansas.
William Ellison.....	Bazette.....	Navarro.....	Texas.
J. E. Bainfield.....	Arrington.....	Atchison.....	Kansas.
F. J. Kirkham.....	Stranger.....	Falls.....	Texas.
L. W. Dennen.....	Havenville.....	Pottawatomie.....	Kansas.
E. W. Kenyon.....	Netawaka.....	Jackson.....	Do.
J. W. Lord.....	New Douglas.....	Madison.....	Illinois.
Benj. McElroy.....	Frankfort.....	Marshall.....	Kansas.
T. Y. Frost.....	Whiting.....	Jackson.....	Do.
D. G. Woodworth.....	Larkin.....	Atchison.....	Do.
H. C. Rogers.....	Gordonville.....	Grayson.....	Texas.
J. P. Allen.....	Pleasant Plain.....	Osborne.....	Kansas.
R. E. Guthrie.....	Guthrieville.....	York.....	South Carolina.
G. Pierce.....	Cottageville.....	Colleton.....	Do.
H. L. Brown.....	Invermay.....	Atchison.....	Kansas.
J. L. Hoskins.....	Hoskins.....	Rooks.....	Do.
Isaac Hoch.....	De Soto.....	Dallas.....	Iowa.
James Washburn.....	Buck Creek.....	Richland.....	Wisconsin.
Benj. Tripp.....	Grand Centre.....	Osborne.....	Kansas.
J. M. Fike.....	Stockton.....	Rooks.....	Do.
N. E. Blue.....	Ontario.....	Jackson.....	Do.
John L. Harvey.....	Marne.....	Cass.....	Iowa.
Jacob Kerper.....	New Vienna.....	Dubuque.....	Do.
F. A. Pope.....	Caledonia.....	Houston.....	Minnesota.
J. W. Beatty.....	Cascade.....	Dubuque.....	Iowa.
O. H. Carroll.....	Ross Station.....	Colleton.....	South Carolina.
Thos. J. Powers.....	Sterling.....	Rice.....	Kansas.
R. J. Rowe.....	Cherokee.....	Cherokee.....	Iowa.
J. H. Montgomery.....	Meadville.....	Crawford.....	Pennsylvania.
James Kelly.....	Wyoming.....	Marshall.....	Kansas.

APPENDIX 66 E.

Details relative to progress in bibliography.

[Prepared by Mr. C. J. Sawyer, Bibliographer].

I. SOURCES OF NEW TITLES.

Number of titles.

Royal Society, Catalogue of scientific papers, vii, viii. L., 1877, '79.....	4,488
Reuss, Repertorium commentationum, iv, Physica. Gott., 1805.....	1,384
Poggendorff, Biographisch literarisches Handwörterbuch. Lpz., 1883. 2 volumes.....	1,000
Hellmann, Repertorium der Deutschen Meteorologie. Lpz., 1883.....	5,200
Bibliographies, catalogues, &c., 141 volumes.....	1,487
Manuscript lists and bibliographies.....	1,082
Periodicals indexed, 2,203 volumes.....	5,697
Total added.....	20,338
Number on hand July 1, 1884, about.....	26,853

Total July 1, 1885, about..... 47,191

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II. INSTITUTIONS AND INDIVIDUALS TO WHOM THE OFFICE IS INDEBTED FOR IMPORTANT CONTRIBUTIONS.

SPECIAL BIBLIOGRAPHIES.

Denmark: Manuscript, from C. Brunn, librarian Royal Library, Copenhagen.
 German Empire: Dr. Hellmann has kindly permitted the incorporation of his admirable Repertorium.
 Japan: Manuscript, from Dr. E. Knipping.
 Norway: Manuscript, from Prof. H. Mohn.
 Poland: Manuscript, from Dr. F. Karlinaki.
 Portugal: Manuscript, from J. C. de Brito Capello.
 Roumania: Manuscript, from Dr. S. C. Hepites.
 Russia: Manuscript, from Profs. H. Wild and A. Woelfof.
 Spain: Manuscript, from Don C. Pujazon and M. Merino.
 Styria: Manuscript, from Prof. R. von Miller-Haunfels.
 Sweden: Manuscript, from C. Annerstedt, librarian University Library, Upsala.
 Victoria: Manuscript, from R. L. J. Ellery.

EXTRACTS FROM MANUSCRIPT CATALOGUES.

Library of the Deutsche Seewarte, from Dr. George Neumayer.
 Library of the Central Anstalt, Vienna, from Dr. J. Hann.
 Library of the Universiteit van Amsterdam, from Dr. H. G. Rogga.
 Library of the Meteorological Office, London, from R. H. Scott.
 Library of Yale College, from Prof. E. Loomis.
 Astor, Boston Public, and Harvard College libraries, from their librarians.
 The librarians of the American Philosophical Society, Academy of Natural Sciences, Ridgeway Branch of Philadelphia Library Company, and the Mercantile Library of Philadelphia; of the Peabody Institute and Johns Hopkins University, of Baltimore; and of the Library of Congress, have afforded special facilities for the collection of material.

Valuable printed catalogues have been received from the Nederlandsch meteorologisch Instituut, Utrecht; Ufficio centrale di Meteorologia, Rome; Osservatorio di Capodimonte, Naples; Société de Physique et d'Histoire Naturelle de Genève, through Prof. A. de Candolle; Service hydrometrique du Bassin de la Seine, Paris, through M. G. Lemoine; Akademie der Wissenschaften, Munich; Nicolai Haupt-Sternwarte, Pulkowa; Finska Vetenskaps Societeten, Helsingfors; Institution of Civil Engineers, London; American Philosophical Society, Franklin Institute, American Antiquarian Society, and others.

MISCELLANEOUS CONTRIBUTIONS.

Prof. G. J. Symons has added to his original catalogue a large number of anonymous titles; Dr. Sophus Tromholt has furnished a list of titles on the aurora; Lieut. Jules de Schokalsky, of the Russian Navy, has very kindly indexed for us the complete set of the Moskoi Sbornik, adding translations of titles; Prof. C. Pittel, of Florence, has contributed Italian titles; R. Mueller, director of the Hydrographic Office at Pola, an index to their publications.

In this country the late Dr. F. B. Hough furnished an index to the contents of volumes in his valuable library; Prof. M. W. Harrington kindly loaned his extensive card-working index for comparison; Dr. H. B. Baker indexed the publications of the Michigan State board of health, and many others have assisted in this work by short lists and valuable suggestions.

APPENDIX 67.

REPORT OF PHYSICAL LABORATORY DIVISION FOR 1884-'85.

The CHIEF SIGNAL OFFICER, UNITED STATES ARMY:

SIR: I have the honor to submit the following report of the principal operations of the Physical Laboratory Division for the year ending June 30, 1885:

This division was known as the Meteorological Observatory up to January 19, 1885. On that day the experimental laboratory, which was in process of formation, was consolidated with it, the name was changed as above, and the writer was put in charge, relieving Lieutenant Allen. Owing to this change, the report, in so far as it refers to the first six months of the year, cannot be so full and satisfactory as it would have been had Lieutenant Allen remained to aid in its preparation.

This division is charged with "the custody of all meteorological instruments, and their examination and repair; the preservation, comparison, and adjustment of standards and substandards; the testing of all instruments issued for station use, and the determination of their corrections; and with the inauguration of a system of measurements of atmospheric electricity, ground currents, and earth temperatures, and the supervision of men assigned to this work. To it may be referred any questions involving experimental research, and especially those pertaining to the subjects of electricity and heat." (Instructions No. 6, 1885.)

The total number of instruments of all kinds received by the division during the year was 1,945, of which over 1,600 were thermometers. This number includes all that were purchased by the office and all that were returned from stations for comparison, &c., and a small number received from private individuals. There were issued to stations and volunteer observers 2,045, and to private individuals 283, making a total issued of 2,328. Of the instruments issued, over 1,700 were thermometers. This statement does not include wind-vanes and rain-gauges, which until recently were received and issued by the property and disbursing officer without passing through this division.

During the year, 1,858 thermometers were compared with the office standards, and a correction card prepared for issue with each. Two hundred and thirty of these comparisons were made for private individuals. All of the barometers issued were compared with the standards, 160 barometer tubes were filled and boiled, and 109 barometers were repaired. Most of the self-registering instruments kept in what is known as the "instrument room" have been continuously at work during the year, and continuous registers of temperature, pressure, rain, and wind at this office have been filed away. Frequent comparisons with non-registering standards, the results of which are noted on the record sheets, render these records of great value, and it is only to be regretted that the Service is unable at present to largely extend the system of self-registry.

Plans for the improvement of the apparatus for the comparison of thermometers are now under consideration. Although the methods now in use are extremely satisfactory as to the results obtained, the apparatus is rather crude, and its use involves more time and labor than is actually necessary. There are still some thermometers in use in the service which have not been compared with the standards of the office.

The work of comparison has been carried on as rapidly as possible without a considerable increase in the stock of thermometers carried by the office, as it is always necessary to issue instruments to take the place of those called in.

The improvement of the rain gauge used in the service is a subject to which much attention has been given during the year. As a result a new model gauge has been constructed, and, upon being recommended by the board on instruments, has been adopted. In the future all gauges issued will conform to this model.

The principal points of difference between this gauge and the old are a change in the material of the collector and the tube and a great increase in the strength and rigidity of the same. The collector is of heavy brass, 8 inches in diameter, beveled on the outside so as to give it a tolerably sharp edge. The tube into which the water flows is also of brass, thick and strong, 20 inches deep, and its diameter is such that the ratio of the area of the collector to that of the tube is as nearly as possible ten to one. A new stick has also been adopted, graduated much more accurately than the old and of a different

kind of wood, which shows the water line much more distinctly and accurately. In cross-section it is so made as to be just 1 per cent. of the area of the tube. The new gauges will also be numbered and calibrated, so that a correction card can be furnished with each, and it is believed that their introduction will increase the accuracy of our observations of rainfall.

A new anemometer-support has been devised and adopted, which is believed to be a great improvement upon the old form. In the new support a cross-bar, upon which the anemometer rests, is run up and down a T-shaped bar of iron, by means of a chain, with which the observer controls the motion. The cross-bar is arranged to support two anemometers, so that monthly comparisons of the station and extra instrument can readily be made.

Arrangements are also made for the easy addition of a third arm, in order to facilitate comparison with anemometers carried by the inspectors. The adoption of this new support is thought to be an important step in the direction of a much-needed improvement in anemometry. Improvements in the anemometer itself are also under consideration, which will strengthen its weaker parts and diminish the number of damaged instruments annually returned to this office.

Experiments are in progress looking to the substitution of an iron cistern with metal plunger for the leather barometer cistern now in use. The latter are constantly giving way and the expense of repair is considerable.

The relative value of spherical and cylindrical bulbs for thermometers has been the subject of experiment and consideration. Tests of sensitiveness have been made in air and in water, and as dry and wet bulbs. In all experiments the superiority of the cylindrical bulb was demonstrated. The subject has been specially referred to Professor Ferrel and Junior Professor Russell, and although no formal report has as yet been made, it seems highly probable that the use of the cylindrical bulb in preference to the spherical will be recommended. Should the cylindrical bulb be adopted the change can be brought about gradually, and it will also enable the office to utilize a large number of cylindrical bulb thermometers, "hygro-tubes," so called, which were called in some time ago on account of not being stem-graduated.

Junior Professor Russell, who has had the subject of the standard of thermometry under consideration for two years or more, has nearly completed a paper containing an account of his work in detail and a full discussion of the whole question. The non-arrival of a few thermometers, specially made and compared at low temperatures with the Kew standards, is the cause of the delay in forwarding this paper to the Chief Signal Officer.

Reference has been made from time to time in the report of the Chief Signal Officer to the efforts of the office to establish a normal barometer. The continued illness of Junior Professor Waldo has prevented the preparation of a report which he was expected to make upon European standards, and the comparisons made by him of barometers belonging to this office with several of the most important normal barometers of Europe. Little progress has been made, therefore, during the year in this direction. The model constructed by Professor Wright, of New Haven, has been examined by the writer, and steps looking to the construction of a suitable cathetometer have been taken. The increased appropriation for the manufacture and repair of instruments, which became available on July 1, will enable the office, it is hoped, to carry out well-matured plans for the erection of this important instrument.

The subject of hygrometry and the improvement of hygrometric observations and tables has received the attention of the office for several years. In March, 1885, Junior Professor Marvin, attached to this division, was sent to Colorado Springs and Pike's Peak for the purpose of making a complete series of observations at various altitudes with various forms of psychrometer. He has made weekly reports to this office, giving the results of his work in detail. These results have been placed in the hands of Professor Ferrel, to whom the duty of discussing them has been assigned. The work thus far appears to be eminently successful. Professor Marvin will complete his observations on the mountain about August 10. After his return to this office it is intended to supplement the observations made at Pike's Peak and elsewhere by such experiments and researches in this laboratory as may seem desirable.

A series of four balloon ascents in the interests of meteorology were made by Private Hammon, attached to this division, in January, March, and April. The point of departure was in all cases Philadelphia, the dates and places of landing being as follows: First ascent, January 19, 1885, landing at Manahawken, N. J.; second ascent, March 13, 1885, landing near Birdsborough, Pa.; third ascent, March 27, 1885, landing at Tremley, near Rahway, N. J.; fourth ascent, April 10, 1885, landing at Williamstown, N. J.

The general instructions governing Mr. Hammon in these ascents were given by Professor Abbe, in charge of the study-room division. Mr. Hammon has made a full report of this work which has been referred to Professor Abbe for examination and remark.

When the writer was put in charge of the work of this division, two stations for the study of atmospheric electricity had already been established—one at Baltimore, in connection with the Johns Hopkins University, and the other at Cambridge, Mass., in connection with Harvard University.

The work of the observer at Baltimore, Private Park Morrill, was under the immediate supervision of Professor Rowland. At Cambridge the work of Privates McRae and McAdie was under the direction of Professor Trowbridge. At Baltimore, by means of a Mascart mirror electrometer, a continuous photographic record of the potential of the atmosphere has been maintained. Mr. Morrill, in Signal Service Note, No. XVII, has discussed the method of observation and has given the results of some studies of the connection between variations in potential and other meteorological elements. Experiments have also been made in the direction of the improvement of the water-dropping collector, or rather the substitution of a mechanical collector for the water dropper. The latter is practically useless in the winter season, and it is believed that a mechanical collector can be devised which will be equally as efficient at all times and suitable for use in all climates. Patterns have been made for one designed at Baltimore, and the construction of a model will probably be undertaken. Experiments have also been made at Baltimore to determine the best form of charging batteries for the electrometer, but no definite conclusion has yet been reached.

At Cambridge much attention has been given to the study of different forms of electrometers. Two instruments designed by Professor Trowbridge have been made and tested with very satisfactory results. Interesting experiments have also been made in determining the potential of the atmosphere by means of kites. These have been used in Cambridge and also on the summit of Blue Hill near Boston. At the latter point very high differences of potential between the earth and the string holding the kite were found, and some very interesting observations were made.

During the progress of this work at Baltimore and Cambridge Professors Rowland and Trowbridge have taken great interest in it and much of its success must be attributed to their hearty co operation with the service, and to the facilities so generously afforded by the authorities of Johns Hopkins University and of Harvard University.

Recently the subject has been taken up in the laboratory of this division. No attempt will be made for the present to secure a continuous photographic record as it seems more desirable to make at first a thorough investigation of instruments and methods. With that end in view several electrometers have been ordered, only one being available at present. Various questions connected with collectors, electrometers, exposure, &c., will be investigated. When uniform and satisfactory results are attainable and by the simplest means, the establishment of several additional stations in different parts of the country will be recommended.

The selection and construction of suitable thermometers for the measurement of ground temperatures has received a good deal of attention. Several forms of electric thermometer have been made the subject of experiment. A careful test of the thermo-electric method has shown that it is too uncertain in its results for general use. A form of resistance thermometer has been constructed which promises to give excellent satisfaction, and a new form of differential resistance thermometer has been devised which seems to possess many advantages over any other method. A practical test of these thermometers will be made at an early date which will be sufficiently prolonged to enable us to decide with certainty upon their efficiency.

There is great and pressing need for a suitable building in which the work of the physical laboratory division can be concentrated and rendered vastly more efficient. It is now carried on in several rooms, not connected with each other and all quite unsuitable for the work assigned to them. The constantly increasing demands which are made upon this experimental branch of the service can only be satisfied when ampler room and better facilities are afforded. It must constantly be a source of regret that, in the present condition of the division with its limitations as to room and facilities, it is impossible to take up some of the most important experimental problems which arise in the service.

Respectfully,

T. C. MENDENHALL,
Professor and Assistant-in-charge of Physical Laboratory Division.

JULY 27, 1885.

APPENDIX 68.

REPORT OF OFFICER IN CHARGE OF PROPERTY AND DISBURSING DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington City, July 15, 1885.

SIR: I have the honor to submit the following statement of the work of the Property and Disbursing Division for the fiscal year ended June 30, 1885, as required for the Annual Report of the Chief Signal Officer.

No changes of importance have occurred in the *personnel* of the division since last report.

Two hundred and twelve dollars and thirty-five cents have been received, during the year, from the sales of maps and bulletins, as allowed by the act of Congress approved March 30, 1874 (section 227, Revised Statutes).

In the "settlement of accounts room" the pay accounts of the entire corps have been examined, prepared for settlement, and through this room settled, aggregating 10,278 accounts.

The number of accounts growing out of the disbursement of the regular appropriations expended by this office, settled during the year, has been 7,976, making an average number per month of 664. This is caused by the large number of stations and the character of the accounts incurred at each, they being for small items of rent, hire, &c., which require monthly or quarterly payment.

The improved methods of administering the duties of this division have continued, and have resulted in the gratifying fact that the accounts pass the very critical scrutiny of the accounting officers of the Treasury with few suspensions, and these for mere technical informalities.

One of the reforms instituted by me was to pay all vouchers by checks drawn to order, in no case to bearer, that mode being considered the safest, not only of transmitting money, but it also furnishes the assurance (as the checks have to be indorsed by the person in whose name drawn before payment) that the money reaches the person for whom intended.

The advantage afforded to obtain greater accuracy by having instruments compared with our standards for which no extra charge is made, still continues to induce many private persons, institutions of learning, &c., to purchase instruments through this office, and during the year there have been 247 instruments of various kinds purchased, representing a total cost of \$1,888.55. These transactions have no connection with the public funds disbursed by me.

Six hundred and seventy instruments of various kinds have been purchased during the year for the use of this service, and 1,639 have been issued since last report.

The average cost of maintaining each station of observation during the year, including cost of printing stations and additional cost of life-saving stations, but exclusive of the cost of telegraphic services and the pay and allowances of the men on duty at each, has been \$329.54, but this cost, as well as that reported in previous reports, represents only the amount spent at each station, and is therefore calculated to convey an erroneous impression; the absolute average is about \$1,500 per annum for each station (which includes all expenses, except pay and allowances of the men).

The total number of letters received during the year was 37,954, an increase over last year of 5,445 letters; the total number of letters sent was 33,330, and 2,710 indorsements, an increase in letters sent of 4,482 over last year.

In the "packing and shipping room" there were 18,080 distinct shipments made, through the Quartermaster's Department, by express, and by mail, with not an article lost in transit.

There were received, during the year, 5,241 packages.

The usual quantity of work has been done in the "machine shops," in manufacturing and repairing meteorological and other instruments, and in repairs about the office.

The "carpenter shop" has been kept busy in making the necessary packing boxes for shipment of supplies, &c., and jobbing and repairs about the office.

The "library" has received during the year by purchase, exchange, or gift, 1,027 books, and now contains 9,743 volumes.

The condition of the appropriations (disbursed by this office) for the fiscal year ending June 30, 1885, with expenditures thereunder and balances unexpended at the end of the year, with probable demands on such balances as required to be rendered by act of Congress approved May 1, 1829, is as follows:

APPROPRIATED.

Observation and report of storms.....	\$241,000 00
Expenses Signal Service, United States Army.....	5,000 00
Maintenance and repair military telegraph line.....	24,000 00
Establishing stations, Island of Nantucket.....	40,000 00

EXPENDED.

Observation and report of storms.....	\$146,546 02
Expenses Signal Service, United States Army.....	1,578 37
Maintenance and repair military telegraph line.....	19,768 02
Establishing station, Island of Nantucket.....	-----

BALANCES.

Observation and report of storms.....	\$94,453 98
Expenses Signal Service, United States Army.....	3,421 63
Maintenance and repair military telegraph line.....	4,231 98
Establishing stations, Island of Nantucket.....	40,000 00

PROBABLE DEMANDS.

Observation and report of storms.....	\$60,000 00
Expenses Signal Service, United States Army.....	3,421 63
Maintenance and repair military telegraph lines.....	4,231 98
Establishing stations, Island of Nantucket.....	40,000 00

On July 1, 1884, there were employed in the division, 74 men (40 enlisted and 34 civilians, the latter including all messengers and laborers); on June 30, 1885, there were only 67 men (35 enlisted and 32 civilians, the latter including all messengers and laborers), showing a decrease of 5 enlisted men and 2 civilians.

At the close of the fiscal year ending June 30, 1884, there were 60 telegraph stations in operation, 4 having been closed during the year ending June 30, 1885, and 2 having been added, making a total of 77 stations in operation on June 30, 1885, reporting to this office.

The receipts from the 77 stations during the year were \$16,389.50, of which the sum of \$8,332.63 was collected for and paid to other lines.

The money value of "free business" (official messages), if paid for, would have been \$10,695.90.

During the year 5,080 forms have been received from the telegraph stations and examined.

The amounts appropriated under the different heads for the support of the Signal Service, United States Army, for the fiscal year ending June 30, 1885, are as follows:

Legislative, executive, and judicial:

Regular clerks, messengers, &c.....	\$10,680 00
Scientific experts, clerks, &c.....	45,000 00
Postage-stamps Postal Union countries, allotted by the Secretary of War.....	1,080 00
Stationery, allotted by the Secretary of War.....	3,583 34
Contingent expenses, allotted by the Secretary of War.....	7,017 49
Rent of buildings for Signal Office.....	7,000 00

Total.....	74,340 83
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Sundry Civil expenses:

Observation and report of storms:

Manufacture, purchase, and repair of instruments.....	\$5,500 00
Telegraphing reports.....	136,000 00
Expenses storm signals.....	10,000 00
Cotton-belt reports.....	7,000 00
Connection life-saving stations.....	5,500 00
Instrument shelters.....	2,000 00
Rents, &c., of offices outside of Washington.....	40,000 00
River and flood reports.....	10,000 00
Maps and bulletins.....	25,000 00

Total.....	341,000 00
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Maintenance and repair military telegraph lines.....	24,000 00
Stations at Nantucket Island.....	40,000 00

Support of the Army:	
Expenses Signal Service, United States Army.....	\$5,000 00
Pay, &c., of the Signal Corps:	
Pay of officers	30,500 00
Pay of enlisted men	200,000 00
Mileage to officers	5,000 00
Cost of telegrams	250 00
Pay of contract surgeon	1,200 00
Commutation of quarters to officers	8,208 00
Total	245,158 00
Subsistence Department:	
Subsistence and commutation of rations, Signal Corps	155,000 00
Quartermaster's Department:	
Regular supplies:	
Fuel	6,200 00
Commutation of fuel at \$9 per month	23,760 00
Commutation of fuel at \$8 per month	23,328 00
Forage for animals	3,100 00
Straw for animals	217 00
Straw for bedding	46 08
Stationery at Fort Myer	100 00
Stores and repairs to heating apparatus	600 00
Lights at Fort Myer	300 00
Total	57,651 08
Incidental expenses:	
Office furniture, Fort Myer, Virginia	100 00
Horse and mule shoes	500 00
Blacksmiths' and other tools	400 00
Veterinary supplies	300 00
Fire apparatus and disinfectants	200 00
Total	1,500 00
For interment of officers and men	200 00
For apprehension of deserters	120 00
Transportation:	
Materials and funds	25,000 00
Men	8,875 00
Means of transportation, mules	1,000 00
Means of transportation, harness	130 00
Means of transportation, repairs to	500 00
Total	35,505 00
Barracks and quarters:	
Commutation of quarters	84,108 00
Work and supplies at Fort Myer, Virginia	1,500 00
Work and supplies on hospital	300 00
Total	85,908 00
Clothing, camp and garrison equipage:	
Six wall tents, &c	415 80
Issues in kind	4,900 00
Total	5,315 80
Medical Department:	
Medical attendance, &c., officers and men	5,000 00
Medical attendance, &c., officers with Signal Corps	100 00
Medical and hospital supplies, Fort Myer	700 00
Medicine from depots, &c	1,000 00
Material for repairs to hospital	200 00
Total	7,000 00
Printing and binding (allotted by Secretary of War) about	40,000 00
Grand total	1,017,698 17

The appropriation for fuel was not sufficient for our stations, many of which, in the extreme northwest country, require fires the year round, and in those latitudes the cost of fuel is proportionately high; the officers of the service have been allowed, by paragraph 1851 Army Regulations, to purchase fuel at a fixed rate, the Government paying the difference, but, by the insufficiency of the appropriation mentioned, this privilege has been denied to them for a portion of the time.

As questions have arisen as to the law under which the printing of the professional papers, &c., of this service is done, I would suggest that Congress be asked to appropriate hereafter, specifically in the appropriations, both for "maps and bulletin" and for "printing and binding," using the language of our estimates. (See pp. 180 and 199, Ex. Doc. No. 5, H. R., 48th Congress, second session.)

In regard to my responsibility for the property belonging to this service, I would say that under the present rules each article purchased is taken up on a property report which is rendered quarterly to the Chief Signal Officer for transmission to the Third Auditor of the Treasury, so that not one article, from the merest trifle to the most expensive instrument that is bought, but what is carefully reported every three months to the accounting officers of the Treasury; and when it is considered that the property is scattered over the United States at all the stations of this service, and that frequent inventories have demonstrated the absolute accuracy of my reports, the vast amount of care required to produce such a result can be more readily appreciated.

In connection with the above I would say that the store-houses for the valuable instruments and other property at this office are leaky, wooden sheds, entirely inadequate, insecure, and unsafe for the storage of valuable Government property; and as during the year a fire in one of the buildings occupied by this office came near destroying a very valuable lot of records (it did destroy considerable furniture and instruments), I would invite attention to the estimate, twice before submitted to Congress, for the purchase of a site and the erection thereon of a fire-proof building for offices suitable for the uses of the Signal Service, as per plan and estimate contained in Senate Ex. Doc. No. 152, Forty-eighth Congress, first session, and would suggest that said estimate be again submitted and, for the reasons given, an appropriation urged.

As Special Orders No. 90, Adjutant-General's Office, 1885, relieved me, at my request, on the 30th day of June, 1885, from duty at this office, it is proper for me to say, in transferring the duties of my division to my successor, that the work is well up to date, except in one or two cases of indexing and in the completion of the inspection reports of the officers recently returned from inspection tours; but in these cases the additional labor of a complete inventory incident to the transfer, as well as a somewhat limited force of clerks, are the causes.

I would call to the attention of the Chief Signal Officer the efficient service rendered me by my chief clerk, Mr. W. R. Bushby, and the chiefs of subdivisions and other men employed in this division.

They are, generally speaking, all good, deserving men.

Very respectfully, your obedient servant,

S. M. MILLS,

Captain, Fifth Artillery,

Late P. and D. Officer, Signal Service, U. S. A.

THE CHIEF SIGNAL OFFICER OF THE ARMY,

Washington, D. C.

APPENDIX 69.

REPORT OF OFFICER IN CHARGE OF EXAMINER'S DIVISION.

SIGNAL OFFICE,
Washington City, July 16, 1885.

SIR: In accordance with instructions contained in Memorandum No. 121, dated Signal Office, July 7, 1885, I have the honor to submit the following report for the fiscal year ending June 30, 1885.

The examiner's division, which was instituted by Instructions No. 176, series of 1881, was at the beginning of the fiscal year under charge of First Lieut. P. H. Ray, Eighth Infantry, Acting Signal Officer, United States Army, and so continued until March 6, 1885, when I assumed charge, in accordance with Memorandum No. 35, dated Signal Office, March 2, 1885.

Sergt. Otto Holtzworth was chief clerk until December 20, 1884, when he was relieved from duty in the division, Sergt. James B. Newlin being assigned to succeed him by memorandum dated Signal Office, December 27, 1884.

Besides the chief clerk the regular working force of the division consists of one civilian and one enlisted clerk; but on April 29, 1885, two additional men were temporarily assigned to assist in bringing up the back work of the division, which at the time I assumed charge was in most particulars from six to eight months behind. With the assistance of these men and the steady, industrious work of the regular force the work (with a few exceptions, where irregularities exist, which are in course of adjustment) has been brought up to date.

One of these men was relieved on June 26 and returned to the division from whence he came, his services being no longer needed, and the other one continued on duty at the close of the year.

The work performed during the year is briefly set forth in the following summary.

Summary.

Month.	Returns of signal equipments and stores examined and forwarded to the United States Treasury.	Letters sent in connection with the examination of money and property returns.	Letters received and recorded.	Requisitions for purchases and expenditures received, examined, and recorded.	Purchase-vouchers audited and recorded.	Expenditure-vouchers audited and recorded.	Accounts current, line receipts examined and forwarded to the United States Treasury.	Weekly statements of public funds received and verified.	Accounts current of Capt. B. M. Mills, property and disbursing officer, for appropriations audited and forwarded to the United States Treasury.	Accounts current for sales at auction, audited and forwarded to the United States Treasury.
1884:										
July.....	30	359	227	474	105	716	10	30		0
August.....	160	283	75	353	98	589	13	16		0
September.....	58	161	93	208	143	780	5	30		0
October.....	102	367	239	294	122	731	5	14		0
November.....	0	83	105	223	153	656	8	15		0
December.....	13	86	120	349	230	519	0	14		0
1885:										
January.....	48	305	262	305	147	574	0	10	0	0
February.....	185	300	106	190	135	294	0	13	1	0
March.....	152	319	100	288	149	455	5	13	1	0
April.....	111	398	371	281	118	489	2	14	1	0
May.....	124	368	135	237	161	415	4	11	3	0
June.....	29	145	111	165	8	201	0	14	2	0
Total.....	*1,012	3,174	1,844	3,455	1,569	6,419	*87	173	*29	8

* These figures do not, however, represent the actual number of papers handled, as in nearly every instance the returns and accounts are accompanied by numbers of vouchers and sub-vouchers varying from one or two to upwards of a thousand in some of the money accounts of Capt. B. M. Mills, Fifth Artillery, property and disbursing officer, where the number of papers pertaining to each account has averaged about eight hundred, or about sixteen thousand papers for the twenty accounts of his examined during the year, which do not appear as a separate item in the summary.

The duties of the examiner's division consist in a careful scrutiny of all letters of authority (technically termed requisitions) and vouchers, and a thorough and complete examination of all money accounts and property returns pertaining to the Signal Service previously to forwarding them to the Third Auditor of the Treasury.

Formal letters of authority (requisitions) for all purchases and expenditures are prepared by the property and disbursing officer and sent to the examiner's division, where, if after examination they are found to be proper and according to regulations, they are, if for a less sum than \$100, indorsed on their faces, "E. O. No. —." By order of the Chief Signal Officer," and signed officially by the examining officer; but those for \$100 and over are signed by the Chief Signal Officer, and are then given an E. O. No. —, and recorded. After being passed by the examiner, the letters of authority are returned to the property and disbursing officer.

In cases where bills are rendered for amounts greater than the letter of authority calls for, if after examination the account is found to be correct, and the additional amount was inseparable from the amount authorized, and could not have been anticipated, the letters of authority are, on request of the property and disbursing officer, stamped "Increased, by order of the Chief Signal Officer, from \$—— to \$——," and officially signed by the examining officer, and are then returned to the property and disbursing officer.

All vouchers are carefully examined with the original bills and letters of authority, and when satisfied that the articles purchased have been delivered, or that the services charged for have been rendered, or that payment has been ordered under the signature of the Chief Signal Officer, where no previous authority exists, those for sums of less than \$100 are stamped "Approved. \$——." By order of the Chief Signal Officer, E. O. No. —," and officially signed by the examiner, and are then returned to the property and disbursing officer for payment.

All vouchers for \$100 and over when found to be correct are approved under the autograph signature of the Chief Signal Officer, and in no case is a voucher approved where its amount exceeds that of the original letter of authority.

Telegraph services are rendered without formal requisition, and the original bills for the same, after having been examined, corrected, and audited by the officer in charge of the telegraph division, and after having received the approval of the Chief Signal Officer, are, together with vouchers prepared by the property and disbursing officer, sent to the examiner's division, where, after proper scrutiny, the vouchers are, if found correct, stamped for approval in the same manner as for other vouchers.

All vouchers as well as requisitions are recorded in serial order, beginning with No. 1, at the commencement of the calendar year, the purchase vouchers being recorded in the record of purchases, and those for expenditures in the record of persons and articles hired. All money accounts of officers of the service disbursing public money are examined as to their correctness, and to see that all regulations of the Treasury and the office, as laid down in Instructions No. 15, dated Signal Office, March 1, 1885, are complied with. All differences are noted, and at the end of the examination a statement of them is furnished to the officer accountable, and the account is held until the differences have all been adjusted.

The purchases pertaining to each account are checked off on the property return of the officer making them, to see that everything is properly accounted for, and the expenditures on the descriptive lists of persons and articles hired, of the officer, to be assured that the services charged for are properly reported.

The expenditure vouchers of the property and disbursing officer are checked off on the record of persons and articles hired (which corresponds with the descriptive lists of persons and articles hired of other officers) in this office, annotation being made in connection with each service, in a column for the purpose, in red ink, as for example, viz: "V. 45-6-25-85.—M.," which indicate that the account was paid on voucher No. 45, on June 25, 1885, by Capt. S. M. Mills, and that the voucher so paid pertains to his June, 1885, accounts as the date indicates.

When this has been done, the services are considered as reported, as per instructions from the Chief Signal Officer, dated February 24, 1885.

After differences have been adjusted and all regulations complied with the accounts are forwarded by letter of transmittal to the Third Auditor of the Treasury, with a statement that the accounts have been examined and found correct.

The returns of officers responsible for Signal property (of which there are upwards of 200) are examined by seeing that all property on hand at the last return is correctly carried forward to the next succeeding return; that all property received (from whatever source) is taken up and accounted for; that all property dropped is done so on proper and legal vouchers, and that the amount on hand to be accounted for is correctly stated.

REPORT OF THE CHIEF SIGNAL OFFICER.

When the correctness of returns has been ascertained those for the preceding quarter are forwarded to the Third Auditor of the Treasury for settlement, and those for the current quarter held to see that the property on hand is properly carried forward to the next subsequent return.

I am, very respectfully, your obedient servant,

FRANK GREENE,

Second Lieutenant, Signal Corps, U. S. A.

The CHIEF SIGNAL OFFICER, UNITED STATES ARMY.

APPENDIX 70.

REPORT OF OFFICER IN CHARGE OF PUBLICATIONS DIVISION.

SIGNAL OFFICE, WAR DEPARTMENT,
Washington, D. C., July 1, 1885.

SIR: I have the honor to submit the following report relative to the publications division for the fiscal year ending June 30, 1885:

The work of the division naturally consists of three distinct classes of labor, draughting, printing, and distribution, each of which has been assigned to an appropriate subdivision, whose employes are specially fitted to perform their respective duties. The general work of the division has been materially increased during the year. This is due chiefly to the greater demand, both at home and abroad, for the publications of the Service, which has necessitated larger editions and proportional increase in labor. The following synopsis of the work performed in the respective subdivisions is respectfully submitted:

DRAUGHTING ROOMS.

During the year the employes herein have reduced by pantograph 2,500 maps, constructed and drawn 610 maps and charts, prepared for transfer to stone 560 maps, and mounted 125 maps; and the sergeant in charge (chief draughtsman) has examined and compared 400,000 maps and charts after they had been printed. In addition to these meteorological data, collected from stations of observation distributed over the entire northern hemisphere and from vessels crossing the seas, have been entered upon maps specially designed therefor; and isobars and isotherms drawn thereon for every day in the year. Monthly means have also been deduced from these daily observations and charted for each month in the year.

PRINTING ROOMS.

The following tabular statement will show the work performed herein:

Publication.	No. printed.	Publication.	No. printed.
Daily Bulletin of International Observations.....	184, 184	Post-office wrappers.....	2, 634, 900
Summary and Review of International Observations.....	7, 380	Envelopes.....	570, 000
Monthly weather review.....	30, 890	Forms (miscellaneous).....	418, 610
Midnight synopsis and special bulletin.....	152, 754	Letters.....	19, 000
Professional papers.....	3, 500	Letter-heads.....	8, 850
Signal Service notes.....	22, 650	Special bulletins (monthly).....	2, 115
History of the Service.....	5, 000	Address slips.....	50, 400
Tornado circulars.....	0, 250	Cold-wave circulars.....	18, 000
General orders.....	44, 750	Advance annual reports.....	1, 500
Special orders.....	17, 785	Instructions to special river observers.....	600
Instructions.....	18, 000	Telegraphic cipher river reports.....	1, 000
Circulars.....	13, 650	Useful information for ship-masters.....	3, 000
		Reports, Alabama weather service.....	24, 000
		Miscellaneous papers.....	56, 049

The work in this subdivision shows a slight increase over that of the preceding year, and experience, better quality of paper, inks, &c., and closer attention to details have produced a marked improvement in its execution. Some new material has recently been added which it is hoped will within the coming year tend to further advancement in this respect. The blank-work of the office has been so much increased during the year as to have added materially to the labor of the subdivision, but it has been handled promptly and executed creditably considering the fact that the machinery in general is old and worn from long-continued usage and must soon be replaced.

There have also been lithographed 745,260 base-maps, 669,823 maps and charts (miscellaneous), 119,935 forms and blanks (miscellaneous), 133,380 letters and letter-heads.

There has been a decided improvement in the lithograph work since my last report, and that now executed at this office is creditable to the service, and will compare favorably with that of any other department or private firm.

DISTRIBUTING ROOMS.

The work of this subdivision has been much increased within the past year. Applications for the publications of the Service have been steadily increasing in number and it has now become necessary to devote both considerable time and labor to their consideration and also to exercise much discretion in action thereon.

The special feature of the work of this subdivision has, however, been the opening of new records, which has entailed a large amount of clerical and other labor, as it was necessary to select from a large number of correspondents, both foreign and domestic, those who were properly entitled to receive the full series of the respective publications, and then to transfer both their names and addresses to the permanent lists therefor. Much care and discrimination have been used in this work, and it is believed that as soon as it has been entirely completed (which it is expected will be done at an early date) the system of record will be found convenient, practical, and well adapted to the requirements of the division. The regular issue of all current publications have been made as promptly as practicable, and in addition to these, surplus Signal Service notes and professional papers which remained on hand after the regular recipients had been supplied were distributed as judiciously as possible, chiefly among that worthy class, voluntary observers, who could properly appreciate their value, and by whom it was thought they would be regarded both as a slight recognition of their services and an incentive to future effort. The arrangement of the retained publications in suitable order has been continued and the "Reserve Publications" are next to be taken up as soon as time and opportunity permit.

The division in general is now believed to be in much better condition than at the close of my last report. Without entering specially into details I may state that modes of operation have been adopted which are better suited to the work to be done and which have materially lessened the labor. The usual series of publications has been continued, and while it was necessary, in consequence of the greater public demand, to increase the editions, due attention has also been paid to their contents, the scope of which has been much extended and the subject-matter, it is believed, proportionally improved. There is still ample room for improvement; but it is thought that the division as now organized will be found capable within the coming year of the proper and creditable performance of the duties that may devolve upon it.

The total number of employes in the division at the close of the year is 44, consisting of 29 enlisted men and 15 civilians, classed as follows:

Clerks	4
Draughtsman in charge	1
Draughtsmen	4
Printer in charge	1
Printers	13
Lithographers	4
Proof-reader	1
Pressman	1
Pressboys	6
Stitchers and folders (3 only on temporary duty)	6
Engineers	1
Messengers	1
Laborers	1
Total	44

S. M. MILLS,

Captain Fifth Artillery, A. S. O., &c., in charge Publications Division.

THE CHIEF SIGNAL OFFICER OF THE ARMY.

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